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## ORIGINAL ARTICLES.

### SOME POINTS IN THE TREATMENT OF ACUTE RHEUMATISM.<sup>1</sup>

BY W. H. THOMSON, M.D., LL.D.,  
OF NEW YORK.

THIS subject can now be dealt with only in some of its aspects. There is no disease in which the physician will find both successes and failures so frequently occurring as in this common complaint. A beginner in practice is apt to undertake the management of his first case of the kind quite hopefully, for he supposes that he has just the remedy for it in the salicylates. Very likely this particular patient and several others afterward will be soon relieved by the drug; but ere long in another case one joint after another becomes inflamed in prolonged succession. The salicylate doses are multiplied, but so are the inflamed joints; days and weeks pass, the patient meanwhile growing whiter and whiter, while the attendant anxiously consults books for something more, till finally the family suggest a consultation. The consultant asks what the attendant has given, and finds that nearly everything in print has been tried; the question is what the man of long experience will suggest next.

I believe that the most satisfactory position from which to approach this subject of the treatment of acute rheumatism is by endeavoring first to discover if we can be guided at all by facts connected with its etiology and with its clinical course.

In the first place, it is, now generally admitted to be due to a veritable specific bacterial infection. A living toxin-producing organism first gains entrance, then grows into a more or less abundant crop in the system; the resulting symptoms are proportioned to the activity of the growth and to its duration. This view at once removes it from any resemblance to gout, which has nothing to do with a specific micro-organism, and this radical difference ought never to be forgotten.

Being such, has it its own time to get through with its growth, or, in other words, is it self-limited in time like the majority of other specific invaders of the body? The answer to this is that it does seem to have its own seasonal time and course, which may be set at about six weeks. By this it is not claimed that it will produce all its various symptoms or derangements continuously for six weeks, but that it is still to be counted on as present in the system for that length of time. On the other hand, those cases in which it persists to act for a much longer period than six

weeks can be readily accounted for by the analogies of other infections. For example, about one in five patients with typhoid fever in certain epidemics have relapses in which all the stages of typhoid are gone through with again. The practical question then is, do we know of any special causes for these relapses in rheumatic fever so that we can prevent them?

Have we any means for arresting this growth when once begun in the system, or of so modifying it that it may run a comparatively harmless course and thus escape its complications? The first comment on this question is that anything which would arrest the growth would be in the nature of an antidotal germicide. Quinine is such in ague because it is a more or less effective direct poison to the plasmodium malariae, and very probably so is arsenic. The salicylates have been regarded by some as similar agents against the micro-organisms of rheumatism, but there are several weighty considerations against this view. Aside from controlling the symptom pain and thus allaying the accompanying irritation, it is doubtful if these drugs modify much else in the development of the disease. Their action, therefore, would seem to be mainly on some properties of the toxin, but not on the organism which produces the toxin, which shows that they are not true germicides. Aside from the salicylates there is at present no known specific antidote to the rheumatic infection. We have reason to hope that such may yet be discovered, but that is all.

We are therefore brought back to the question, granted the premise that we have to deal with a bacterial disease, what can we do to help the patient against the effects of this poisoning? The first consideration which comes up now is, how and where did the bacterium enter? We have only one mucous tract which can be named with any degree of probability, that of the tonsils. These structures seem well fitted to become the portals by which the blood can become infected both by bacteria and by their toxins, as in diphtheria, and an antecedent tonsillitis has been noted in about twenty per cent. of cases of acute rheumatism which have been observed with this inquiry in view. My own observations would rate it as high as twenty-five per cent., for often when patients have denied to me that they had had sore throat an examination of their fauces would show distinct signs of tonsillitis. The analogy with gonorrhea which also causes an acute polyarthritis often scarcely distinguishable from that of rheumatism, and generally accompanied by dissemination of the gonococcus in the blood, points strongly to a primary seat of infection on a mucous surface, while the well-known clinical fact that certain patients always expect an attack of rheumatism whenever a sore

<sup>1</sup> Remarks in a discussion before the Section on Medicine, N. Y. Academy of Medicine, October 18, 1901.

throat comes on further strengthens the hypothesis that the tonsils, very often at least, are primarily responsible for this infection. I have therefore recommended thorough douching of the throat as a morning and evening toilet procedure for its prophylactic advantages. With a little practice the tonsils can be as well washed as the hands. One to two teaspoonfuls of chlorate of potash with five drops of oil of wintergreen or oil of peppermint dissolved in a pint of hot water and then directed against the back of the throat by a fountain or Davidson's syringe while the mouth is kept wide open over a basin will disinfect the throat far better and more easily than any swabbing, as I have found in numerous cases of the chronic pharyngitis which tends to implicate the ears. When rheumatic fever has once set in, it may be too late to expect much from this procedure, though we cannot be sure that some further poisoning may not be prevented by it; while, as an efficient preventive against further infection at the first signs of sore throat in patients previously susceptible to rheumatism, I think that I can speak of it quite confidently.

Another fact connected with acute rheumatism is the characteristic development of a remarkable sensitiveness of the skin. The entire extent of the cutaneous nerves from head to foot seems to be specifically excited by the rheumatic toxin from the very beginning; no other infection compares with it in this respect. It resembles the sensitiveness of some persons with a bad cold in the head who can tell when a door is open downstairs though no one else can. Before I accepted the view of its bacterial origin, I used to ascribe rheumatism directly to derangement of some cutaneous function, as gout is dependent upon perverted metabolism in digestive processes; my reasons were based upon the geography, so to speak, of the disease. Rheumatism is endemic wherever the skin is often chilled when it is wet. This statement seems to be negated by the British army reports, which would appear to rate Egypt, where it never rains, as bad a country for rheumatism as Canada; but I found the Bedouin Arabs who dwell in dry deserts particularly subject to it, with an easy explanation therefor. When the Bedouins go to sleep in their tents, as they do soon after sunset, the air is still very hot over the recently glowing sands; but as the night wears on the rapid radiation of heat from ground wholly naked of grass makes the morning hours often bitterly cold. Perspiration first and chill afterward are therefore as common to Arabs as is the chilling of a wet skin to Newfoundland fishermen, and the same may be said of the evenings and mornings of Egypt.

As soon as rheumatic fever sets in, the painful joints are much more sensitive outside than they are inside; in no other inflammation is surface tenderness so extreme. The profuse sweats of acute rheumatism I would ascribe as much to the peculiar condition of the cutaneous nerves as to the presence of the poison in the blood. There-

fore attention to the skin is called for in this disease by indications of no minor importance. While there is no immediate vascular connection between the blood-vessels of the skin and the blood-vessels of subjacent parts or organs, there is no more important fact of applied physiology to medicine than that the association of the cutaneous nerves with the vasomotor nerves of the underlying organs is very close. Stimulant or sedative impressions to the skin will directly produce stimulation or sedation in the circulation of the pleura, pericardium, peritoneum, uterus, inner parts of joints, etc. The sudden cold caused by evaporation from a finely-divided moisture on the skin of a rheumatic patient may at any time initiate a pleurisy or a pericarditis (or aggravate either if present) as certainly as any influence that can be named. All patients with rheumatic fever, therefore, should be jealously dressed in flannel and lie between blankets from the very first, and extra precautions should be taken with the pericardial surface for the same reason. Soothing liniments with abundant dry dressings should likewise be provided for the inflamed joints. I believe that a sedulous attention to the skin would prove a much better preventive of tedious relapses than dosing with drugs, and as a prophylactic to susceptible persons I think highly of the old Greek custom of daily bodily inunctions, especially of the feet. With reference to the cardiac implications, I can only say that I am strongly of the opinion that the modern displacement of treatment with alkalies by the salicylates has been followed by greater frequency of heart troubles. The alkalies are certainly no cures for rheumatic fever, but a faithful dosing with them till the urine is made alkaline, and stays so, is a great safeguard against carditis, and I never should fail to prescribe them as soon as the least sign of impending heart trouble develops. Together with this and all through the course of the disease, as long as the pulse remains quiet, I give aconite, as there is no remedy so serviceable both for the onset of cardiac inflammations and for the prolonged irritability of this organ which follows a rheumatic fever. Rest is the chief indication for the heart now and a necessity which may continue for months, and aconite is the best medicine for securing it.

The anemia caused by the rheumatic toxin is *sui generis*. It has no resemblance to the anemia of chlorosis, and iron, instead of curing it, is mischievous. Cod-liver oil is much more beneficial and every means to insure its assimilation should be attempted. Phosphorus is as problematical here as always, but small doses of arsenic have sometimes seemed to me to be useful.

I have purposely refrained from touching upon the employment of the compounds of salicylates, because they stand in no need of recommendation. Their introduction marked a great gain in the therapeutics of rheumatic fever, particularly in acute cases, with only the usual draw-



back that their efficacy has tended to their employment in a routine fashion. Like all really good remedies they call for discrimination in administration. Thus, the sodium salt which is most in use has the disadvantage of causing serious prostration in some patients when given in full dose, and I think that it occasionally increases the specific effect of the rheumatic toxin in causing mural weakness by the softening of the heart muscle. Now and then also it causes delirium, which is a disquieting symptom in acute rheumatism. My own preference is for the strontium salt as less depressing and of equal efficacy when given in the same dose. Many do best, especially quite young subjects, with salicin itself in doses of fifteen to twenty grains. In tedious subacute cases it is often advantageous to omit the salicylates altogether and prescribe lemon juice instead.

#### THE SYMPTOMATOLOGY AND DIAGNOSIS OF ACUTE ARTICULAR RHEUMATISM.

BY LEONARD WEBER, M.D.,  
OF NEW YORK.

IN trying to outline the symptomatology and diagnosis of acute articular rheumatism, the subject of subacute rheumatism must be touched upon, because it is just here that errors in diagnosis do sometimes occur; I may also be permitted to speak upon some points in the differential diagnosis.

If the essential cause of rheumatic fever be still unknown, I venture to say that by the combined holding of the germ and nervous (i.e., trophoneurotic) theories, I have generally been pretty well able to arrive at an understanding of the etiology of a given case and the more or less severe disturbance of the physiological metabolism of the system in the course of the disorder. To be sure, even with the help of all that is known thus far, you cannot get around the predisposition, inherited or acquired through occupation and environment.

Though an acute attack may be preceded by some malaise, it generally comes on abruptly after exposure; it may take the patient at any time of the year, but I have had many more cases of polyarthritis rheumatica in spring and summer than at other times. The fever rises quickly, and the disease may be fully developed in twenty-four hours, with a temperature of 102 to 104° F., and pulse above 100; the urine is scanty, highly colored and in the majority of cases there are profuse acid sweats. The temperature shows a peculiar irregularity in remission and exacerbation, possibly due to the sweats. Hyperpyrexia with fatal issue I have seen twice in otherwise uncomplicated cases a long time ago, not in later years. Strümpel says hyperpyrexia may occur also with salicylate treatment, and will not be influenced by it, though it may yield perhaps to cold baths. Delirium is always present in hyperpyrexia ending with coma; it may also be manifest in a mild form in ordinary cases, par-

ticularly with alcoholics; two or three times it has been observed by me after somewhat heroic doses of the salicylates. The disease is polyarticular, affecting usually knees, ankles, elbows, wrists. The monarticular form of acute rheumatic arthritis is rare; I have seen two cases, elbow in one, knee in the other, yielding promptly to salicylate of soda and salol, in persons previously suffering from intermittent fever. The vertebral joints are but rarely attacked; I remember one case, however, concerning a student of medicine, in which the lower dorsal and lumbar vertebrae were severely affected and quite obstinately so. The joint effusions are not often large, but pain and tenderness almost always severe. The effusion may extend to neighboring muscles and sheaths of tendons. The blood shows well marked leucocytosis early, and anemia develops rapidly. An apex murmur perceived in the early stage of the disease is generally caused by fever and anemia and is not indicative of endocarditis. When I still hear it after complete defervescence and comparative restoration, my patient is made to stay in bed and is treated as if he had endocarditis—and he then generally has—and is not allowed to rise nor be about for some weeks.

Albumin in the urine is not uncommon and need not worry us; acute parenchymatous nephritis with fatal issue I have seen but once. It was in 1898 in the case of a young man of twenty-four, whose mother had died of rheumatic hyperpyrexia in 1887, and whose brother also had rheumatic fever with endocarditis three years ago, but made a complete recovery.

In the subacute form of articular rheumatism all the above symptoms are less pronounced, fewer joints are affected, the temperature is not high, but the symptom-complex may go on for weeks, and when still less marked may be misinterpreted, until the error in diagnosis is corrected by the appearance of a valvulitis.

Endocarditis is of so frequent occurrence in acute rheumatism that we are justified in calling it one of its features rather than a complication. It is almost always "endocarditis verrucosa benigna," the ulcerative form being very rare, and concerns the mitral valve most frequently. Though there is no evidence of incompetency of the valve soon after the attack, sclerosis and retraction will develop, but may, it is my belief, often be prevented by clever management and persistent treatment.

The course of the disease is extremely variable, and though we have a good right to say that the salicyl preparations are specific in their action for overcoming an attack, they are not specifics in the sense of effecting a cure, and A. Flint and Gull and Sutton may be correct in saying that inflammatory rheumatism is a self-limited disease, and that medication has probably no special influence upon its course and duration.

In briefly considering the differential diagnosis of acute rheumatism, I want to mention: (1) Acute gonorrheal arthritis, which may be multiple, but is more often monarticular, caused by

the gonococcus and staphylococcus. It does not react upon salicylates, a helpful moment for diagnosis if the patient's previous history be obscure or cannot be obtained. This form of arthritis is of rather frequent occurrence. I believe it to be a fact that a slight trauma to a joint that had once been the seat of rheumatism can stir up again a rheumatic arthritis, but I have also the records of two cases of persons who, having had acute articular rheumatism some years before contracting gonorrhea, soon after infection presented the symptom-complex of subacute multiple arthritis with effusion which yields to salicylates and salol, though rather slowly. These cases, in my opinion, were not gonorrheal but rheumatic arthritis plus gonorrhea.

(2) Septic arthritis, puerperal or otherwise, of streptococcus infection, is generally purulent.

(3) The secondary multiple arthritis of acute infectious diseases, in scarlatina, dysentery, cerebro-spinal meningitis, perhaps also in rare cases of severe syphilis, will be recognized by careful examination of the history of the case.

(4) Last year I had a case of multiple neuritis in my clinic concerning upper and lower limbs which had much resemblance to acute rheumatism so far as pain and tenderness in the joints and limbs were concerned, and some periarticular swelling; but then, there was the paralytic lameness, etc., which soon established the diagnosis. In looking up authorities at that time I found that no mention was made of multiple neuritis in the subject of differential diagnosis of rheumatism.

(5) Acute osteomyelitis and necrosis of bone may be multiple and have been mistaken for acute rheumatism. But the disease concerns the shaft of the bone and causes very great constitutional disturbance.

(6) Gout and acute rheumatism will not be easily confounded when the gouty attack is of the classic kind. It is not quite so easy when we have to deal with a case of multiple uric arthritis with periarticular swelling, exquisite tenderness and fever. In the few cases of this kind which I attended, a diligent search for subcutaneous deposits of urates around the joints has been rewarded by finding such, however small, and proved helpful in making a previously doubtful diagnosis certain.

25 West 46th Street.

#### ON THE PATHOGENESIS OF ACUTE ARTICULAR RHEUMATISM.

BY HEINRICH STERN, PH.D., M.D.,  
OF NEW YORK.

For the past lustrum the predominating etiological hypothesis has ascribed the origin of acute articular rheumatism to bacterial activity. Indeed, the clinical features of rheumatic fever would favor the presumption of its infectious nature. The rather abrupt onset, the fluctuating pyrexia, the inclination to recurrence, the production of leucocytosis, the involvement of joints, the synchronous or successive invasion of struc-

tures and organs in different parts of the organism, the self-limitedness, the possible epidemic occurrence—all lend color to the idea of its bacterial character, to confirm which has been the endeavor of a considerable number of investigators.

Sahli,<sup>1</sup> performing a necropsy on a case of acute articular rheumatism, found in addition to the joint affection involvement of the endo- and peri-cardium, the pleura and the bronchial glands. Nowhere had suppuration occurred. He obtained by cultivation from the blood and organs a coccus analogous in every respect to the staphylococcus pyogenes citreus. As he believed, it was either an attenuated suppuration germ or a specific micro-organism related to the pyogenic cocci. Introduced intravenously, subcutaneously, or into the joints of animals it proved non-pathogenic.

On the other hand, from the blood, brain and endocardium of a young woman affected with acute articular rheumatism and following chorea, endocarditis, and nephritis, Westphal, Wassermann and Malkoff<sup>2</sup> isolated a micro-organism which, when inoculated into animals, was productive of polyarthritis. In the exudate of the artificially induced polyarthritis the micrococcus—a streptococcus which in the blood and tissues sometimes appeared as a diplococcus—was recovered and when injected would again produce acute arthritis.

Singer<sup>3</sup> endeavored to demonstrate that rheumatic fever was due to the presence of staphylococci and streptococci in the organism. He examined the blood and urine of a large number of patients and made bacteriological studies also of exudates, etc., obtained from the dead body. The inexactness of his methods, etc., occasioned the controversial reply of Chvostek and Kraus<sup>4</sup>. These authors, citing over 100 cases of acute articular rheumatism, which had come under the observation of various investigators, came to the conclusion that all blood examinations performed by unobjectionable methods, and hitherto published (1898) are absolute proof against the pyemic (staphylococcal) nature of acute articular rheumatism.

Sittmann<sup>5</sup> notwithstanding repeated examinations of the blood of each of his five cases of acute articular rheumatism, could not demonstrate any micro-organisms. He contends, therefore, that we are confronted with a septic condition if pyogenic bacteria are found in the circulating blood or in the joints, and that if no such organisms could be detected, the case was one of genuine rheumatic fever. Michaelis,<sup>6</sup> who had pointed out the occurrence of bacteria in many infectious diseases, never succeeded in obtaining micro-organisms from the blood in cases of acute articular rheumatism. He maintains on this account that a negative result of the bacteriological examination is characteristic of the presence of rheumatic fever.

Having obtained but negative results when examining the exudate of the joints in acute articular rheumatism, F. Meyer<sup>7</sup> made cultures



from tonsillar mucus and found in almost every instance a delicate diplococcus, growing in chains and resembling the one discovered by Wassermann. However, it proved not identical with the latter. It could not be obtained from individuals who were not affected with rheumatic fever. Injected into animals it called forth intra-articular, usually sterile, sero-purulent exudates.

A streptodiplococcus, closely resembling the one described by Meyer, was later found by Allaria<sup>8</sup>. The same was obtained from the tonsillar exudate in which it occurred together with a staphylococcus non-pathogenic to guinea-pigs. The diplococcus is described as being very small, arranged in pairs or in short chains. It stains readily by Gram's method and grows very well on agar with blood. The injection into guinea-pigs of one c. c. of a forty-eight-hour culture was followed after four or five days by swellings in various joints, which, however, soon subsided. The joints of some of the animals who had been killed, contained a serous exudate in which, microscopically, slightly corpuscular elements, but no bacteria, could be distinguished. By cultivation, however, the micrococci were again obtained from the transudate.

In the blood of individuals affected with acute articular rheumatism Achalme<sup>9</sup> found a comparatively large obligate anaerobic micro-organism resembling the bacillus anthracis. It is not a saprophytic bacterium and stains well with aniline dyes and by Gram's method. The organism which may have a capsule, grows best in liquid media. It attains its maximum growth between 30-38° C.; in temperature above 40 or below 25° C., its growth is prevented. Infrequently it forms spores; when occurring they are large and develop on the end. Its inoculation into rabbits and guinea-pigs has been followed by some characteristic symptoms of rheumatism.

Achalme's findings were corroborated by Sawthenkow,<sup>10</sup> who pointed out that chemiotaxic and necrobiotic substances were yielded by the bacillus. Treboulet and Coyon<sup>11</sup> cultivated a facultative anaerobic diplococcus which they presume to be the specific germ of simple rheumatic fever, contending that Achalme's bacillus, which they have also found—alone as well as associated with these diplococci—are the causative factors of the graver types of the affection. On the other hand Predtchensky,<sup>12</sup> who undertook to investigate the presence of Achalme's bacillus in five characteristic cases of acute articular rheumatism, uninfluenced by sodium salicylate, employing utmost precaution and the methods deemed best for the cultivation of the organism, did not find it in a single instance. The cultures of three of his cases remained perfectly sterile. In the cultures from the other two cases he isolated a special micrococcus, arrayed in elements of two, three, and four organisms, facultative aerobic and anaerobic. On solid media these organisms developed in short, on liquid media in longer chains. Inoculation of the organisms into guinea-pigs gave rise to symptoms of rheumatic fever. The

micrococcus was again obtained in pure culture from the blood of the heart and the joint exudate. The observer does not pretend that this organism is the same as the one discovered by Wassermann, but maintains that it is the causal factor in the production of acute articular rheumatism.

Poynton and Paine,<sup>13</sup> searching in vain for Achalme's bacillus, found in eight consecutive cases a diplococcus, growing in liquid media in streptococcal chains of varying length, and in solid media in staphylococcal masses. These organisms stain with aniline dyes, were discolored by Gram's method, and occurred in the form of cocci linked together in pairs. They grow well in a slightly acidulated (lactic acid) medium of milk and bouillon, are aerobic but grow better anaerobically. Intravenously injected into the rabbit, a symptom complex akin to that of rheumatic fever is produced. The authors do not claim that this diplococcus is the only causative agent of acute articular rheumatism, but they contend that it may be shown to be the etiological factor of all cases of the usual form of the infection.

Besides those alluded to, a host of other observers have published their bacteriological findings on the origin of rheumatic fever. Taking into consideration only the results and propositions recited, we can clearly differentiate between the following contentions:

(1) No micro-organisms occur in the blood of articular rheumatism: viz., Sittmann, Michaelis; (2) A specific coccus is present, but is non-pathogenic for animals: viz., Sahli; (3) A specific streptodiplococcus is present, which is pathogenic: viz., Westphal, Wassermann and Malkoff; Meyer, Allaria; Predtchensky; (4) There exist a staphylococcal and streptococcal infection: viz., Singer; (5) A specific bacillus is present: Achalme, Sawthenkow; (6) Diplococci and bacilli occur synchronously: viz., Treboulet and Coyon.

A critical review of all pertaining investigations must take into account the following considerations: (a) *The authenticity of the affection from whence the material to be examined is derived*; (b) *the absolute exclusion of concurring disorders*; (c) *conclusive proof for the non-existence of micro-organisms (diplococci) in tonsils, urethra and vagina, prior to the rheumatic attack*.

A number of affections, resembling acute articular rheumatism in some of its features, are frequently mistaken for it. This is particularly the case with pyemic conditions.

We know that rheumatic fever does not tend to suppurative changes and that whenever it is accompanied or followed by pyemia this is due to an additional infection. Consequently there can be little doubt that in all instances in which streptococci or other pyogenic bacteria were obtained, the prevailing affection was either pyemia *per se*, or pyemia synchronously occurring with rheumatic fever.

Infectious pseudo-rheumatism, scarlatinal arthritis, acute osteomyelitis, gonorrheal invasion of

one or more joints, and other morbid conditions of the articulations are often diagnosed as acute articular rheumatism. In my opinion the different results obtained by the various observers are due to the investigation of various affections other than genuine articular rheumatism, or to the study of the graver forms of the latter disease which is never a malady *sui generis*.

The uncertainty regarding the real nature of the individual cases investigated; the neglect or inability to demonstrate a co-existing infectious or non-infectious disorder; the unconfirmed evidence concerning the absence of known pathogenic bacteria from organs like the tonsils, urethra and vagina prior to the attack; the diversity of the methods employed and the contradictory findings of the various observers—all these show that the hypothesis of the microbic origin of acute articular rheumatism, in spite of an apparent clinical justification, is as yet founded more upon speculation than upon facts.

Since the more exact differentiation between uric acidemia and allied disorders on the one side and the rheumatic affections (so-called) on the other side, and since the advent of the theory of the bacterial causation of acute articular rheumatism, the older presumption of the chemical origin of this affection has received but meager attention.

According to this chemical conception the polyarthritis is due to the excessive production and the retention in the organism of lactic or dextralactic (sarcrolactic) acids and of certain acid salts. Dextralactic acid being a constituent of normal muscle, forms an integral part of the meat extracts of commerce. It is contained in normal venous blood to the amount of 0.0079 per cent. (Berlinerblau), and it leaves the organism by the way of the lungs and the skin in the form of  $\text{CO}_2$  and  $\text{H}_2\text{O}$ . It has been found in the sweat of women affected with puerperal fever and also in the bones in osteomalacia. It enters almost regularly into the composition of pathological exudates, where its occurrence does not invariably seem to depend upon meta- or cata-bolic disorders, but occasionally upon the fermentative activity of the bacteria present. However, as the serous effusion of uncomplicated genuine acute articular rheumatism in all probability is free from bacteria, lactic or dextro-lactic acid if at all present, must be derived from some other source. Supposing the production due to the activity of bacteria contained in the transudate, the acids naturally have to be precluded as etiological factors. It has been contended that the excess of lactic acid in the organism reduced the alkalinescence of the blood. In five cases of acute articular rheumatism in which I determined the degree of blood alkalinity, I found the following: (1) Female, aged twenty-four years, domestic. Blood alkalinescence on the second day of the affection equivalent to 400 milligrammes Na HO to 100 c.c. of blood, and on the sixth day to 373 milligrammes Na HO to 100 c.c. blood; (2) Male, aged thirty-one years, driver. Blood alkalinescence

first week of the affection 320; second week 373; (3) Male, aged twenty-eight years, baker. Blood alkalinescence second day of the affection 426; tenth day 400; (4) Male, aged nineteen years, clerk. Blood alkalinescence first day of the affection 346; seventh day 400; (5) Male, aged thirty-eight years, cook. Blood alkalinescence third day of the affection 373.

Altogether, nine determinations of the blood alkalinescence in acute articular rheumatism were made. The alkalimetric process, which I employed, is a modification of the Loewy-Zuntz method, as devised by Engel, with the exception that n-150,  $\text{C}_{14}\text{H}_{10}\text{O}_8$ , V.S. for reasons of greater accuracy were substituted for n-75,  $\text{C}_{14}\text{H}_{10}\text{O}_8$ , V.S.

The highest alkalinescence met with was calculated to be equivalent to 426, and the lowest to 320 milligrammes Na HO to 100 c.c. blood. The extreme aggregate in the divergency was therefore but 106, while the average alkalinescence calculated in milligrammes of sodium hydrate to 100 c.c. of blood amounted to 379. This is hardly at variance with the normal blood alkalinescence which, according to over 1,000 determinations made by me, fluctuates between 300 and 500. Results similar to mine, demonstrating a normal or almost normal alkalinescence of the blood in rheumatic fever were also obtained by Canard,<sup>14</sup> Karfunkel,<sup>15</sup> and Dessèvre.<sup>16</sup>

The improbability of the microbic manufacture of lactic acid and its isomeric modifications in the effusion of rheumatic fever and of their performance in the blood, forces us to conclude that these acids which were detected in the transudate of some instances of uncomplicated, acute articular rheumatism owe their origin to another factor, probably to an unorganized ferment.

The normal, or almost normal alkalinescence of the blood precludes the occurrence therein—in pathological amounts at least—of any other acid or of acid salts. In rheumatic fever like in the normal state *acid-forming* principles, however, are contained in the blood. While thus the component substances of acids, or of acid salts, may be conveyed by the blood to and through a physically abnormal structure, the acid-formation itself—if occurring at all—takes place *extra sanguinem*.

At all events, from whatever point of view one may consider the formation of pathological quantities of lactic or paralactic acids, or acid salts in rheumatic fever, so much can be stated with certainty that it is never the primary cause of the affection. Moreover, to my knowledge recent literature does not record a single case of acute polyarthritis in which lactic acid had occurred in the urine. Still, it could be maintained that the acid is split up into more simple compounds prior to its excretion by the urine, and that it could thus not be detected in the latter. However, the presence of lactic acid in the urine, which is always of pathological significance, has been demonstrated in a variety of diseases and intoxications, as for instance, after epileptic paroxysms



(Araki), in acute yellow atrophy of the liver (Schultzen and Riess), in leucemia (Jacubasch), after poisoning from carbon monoxide (Münzer, Palma), phosphorus (Schultzen and Riess, Araki), arsenic, morphine, cocaine, amylnitrite, veratrine (Araki), etc. As the acid has also been found in the urine after excessive and prolonged muscular activity (Spiro, Colasanti and Moscatelli), a condition virtually approaching the morbid state in rheumatism. (Prout, Todd, Fuller), there is no reason why it should not be also demonstrable in the urine during defervescence or shortly after an attack of acute articular rheumatism—that is if Prout's contention be true according to which the retention of the sarcolactic acid is the etiological factor of the disease.

In rheumatic fever, the urine which might offer an important etiological clue, is described as highly acid by all authors. However, to designate a urine as "highly" or "weakly" acid without employing an acidimetric unit and a standard of comparison, is inexact, valueless and often misleading.

Urinary acidimetry was performed according to my method<sup>17</sup> with 28 specimens derived from five males affected with acute articular rheumatism. The urine, in each and every instance, was obtained during the first week of the attack, and prior to the administration of alkalies or the salicylates. The highest degree of acidity which I found was 0.76, the lowest 0.29. In the average it amounted to 0.49 degree. Comparing this average acidity with that of the urine of the healthy male which, as determined by the same method, amounts to 0.43, we notice but a very small discrepancy. Taking into consideration also that the urinary secretion during the febrile state is diminished, we may assume that the urine in acute articular rheumatism, as a general rule, does not exhibit an abnormally high degree of acidity.

The greater part of the urinary acidity in acute articular rheumatism seems to be due to its contents of acid sodium phosphate, the acid principle of normal urine. Its output during the pyretic stage of acute polyarthritis is hardly ever increased, although it may seem so when the urine is concentrated. On the other hand the excretion of the total phosphates is always more or less augmented. However, the diurnal urinary density in the mean is hardly ever above 1025 and remains so for forty-eight or seventy-two hours only. Carbamid, it is true, occurs in larger amounts in the urine of rheumatic fever than it does in the normal condition; the deficit in urinary chlorides during the febrile period, however, counterbalances the urea excess, and thus a normal or almost normal specific gravity is maintained. The sulphates are as a rule augmented; I found their increase—occurring in the same ratio as that of carbamid—not so pronounced as have some of the older observers.

The most characteristic alteration in the urine of genuine rheumatic fever is the diminution of the chlorides, a fact which seems of etiological

importance. The chlorides are never totally absent, but may be reduced to one or two grams in the twenty-four hours. I have never found more than 4 or 4.5 grams before defervescence ensued. Decrease of chlorides does not occur to any extent in the urines of other rheumatic disorders, so-called, nor in gouty or other articular affections. This feature of the urine, in my opinion, is, therefore, one of the positive diagnostic signs for the presence of acute articular rheumatism; and I maintain, if the urinary chlorides occur in diurnal amounts of seven or eight grams, or more, during the pyretic stage of an acute case of joint disease, that this is not rheumatic fever. In all pyretic states, it is true, we notice some reduction of urinary chlorides, but the only other febrile affection in which a diminution of these urinary ingredients similar to that in rheumatic fever may ensue is pneumonia, especially during the stage of congestion. However, in the latter malady, the urinary chlorides are not materially lessened in many instances.

The deficit in urinary chlorides in rheumatic fever one might explain as being due to the migration of the blood chlorides into the serous effusion. But why, we must ask, are the urinary chlorides not materially diminished in other affections, as in pleurisy for instance, when the serous effusion is frequently much more extensive? This brings me to what we may call the physical factor or factors underlying the production of acute articular rheumatism.

Fibrous and serous tissues are those structures which are principally involved by the rheumatic process. The affection is so invariably limited to these textures that they may be considered essential to its production. However, not all organs into whose structure fibrous or serous tissue enters are invaded by the disease. Those chiefly attacked are the joints and heart; among the former the larger articulations, and in the latter the fibrous valvular and the investing serous structures in particular. Hence, rheumatic fever may be defined as an affection of the fibrous and serous membranes of the most actively engaged parts of the motor apparatus. We may maintain that inelastic or white fibrous tissue, which composes almost entirely the tendons and ligaments and which enters also into the texture of serous and synovial membranes, is the real seat of the rheumatic process. Inelastic fibrous tissue, the only elementary formation contained in all the structures generally involved by acute articular rheumatism, is peculiarly susceptible to the influence of weak chemicals. Inelastic fibrous tissue, as we remember, is made up of various sized wavy and flexible bundles of fibers, each consisting of minute filaments—the fibrillae. The smaller bundles are held together by interlacing of the fibrils, while the larger ones seem to be agglutinated by a transparent mucous substance. Addition of a weak solution of any acid, as for instance of acetic acid, causes the fibrillae to swell up, so that the entire particle of white fibrous tissue thus treated becomes an indistinguishable

homogeneous mass. The tissue, however, is not dissolved by the acid; for when it is washed with water, or when ammonia is added to effect neutralization, the fibrils become again distinct. Swelling up of the fibrils occurs also if the tissue is placed in solutions of alkalis; the subsequent addition of a considerable quantity of water, however, causes it then to dissolve.

Conditions, analogous in a measure to those artificially induced, may eventually prevail in the organism. While, with the possible exception of some  $\text{CO}_2$ , acids as such do not exist in the blood (in the most pronounced cases of acidosis even, the blood is still alkaline), they may readily enough be formed within a limited area, if from any local cause whatsoever, the supply of ammonia or alkali is diminished. Knowing that white fibrous tissue is formidably altered by solutions which are but acidulated, one cannot refrain from picturing a similar possibility in the system, particularly when the acid formation ensues with great rapidity and within narrow limits.

The acid thus produced seems, however, to be rather the consequence than the cause of the rheumatic affection, and an eventual acid alteration of the white fibrous tissue should, therefore, be regarded as a secondary phenomenon, or as a complication. In case local superacidity existed previous to the establishment of the rheumatic process, it must have been the result of a preceding affection or disorder. Such disturbances, both of systemic as well as of local origin, occur not infrequently and although an acid substance may thus become the progenitor of rheumatism, or what is considered as such, it can be never regarded as its primary etiological factor. The unquestionable fact that in rheumatic fever, the transudate and especially the synovial fluid of the affected joint occasionally contains acid in excess while the blood does not exhibit any abnormally low degree of alkalinity, points to the autochthonous production of the acid material. The further clinical fact that the rheumatic process first appears in the more outlying fibrous structures of a joint, and then concentrically progresses towards the synovial membranes, also confirms the assumption that an eventual hyperacidity (noticeable in the exudate only) must be the result of a pre-existing disturbance. That the acid transudate in the synovial sac, for instance, if in contact with the basic membrane may cause certain alterations in the latter, seems plausible; but any damage thus effected, is secondary, or even tertiary to the original disturbance. Besides, the non-existence of an acid exudate in every instance of rheumatic fever, excludes acid fibrous swelling from our further consideration.

The mucous substance cementing together the fibrillae of inelastic fibrous tissue is readily affected by lime or baryta water, or other weak alkalis. It may thus be completely dissolved out of the tissue. The precipitate of this extract, obtained by acetic acid, consists of mucin. Complete or partial extraction of the agglutinating material

is followed by more or less pronounced separation of the fibrils.

The amount of cementing substance varies in the different portions of the organism and in different individuals. In the process of connective tissue production all cellular energy may be directed towards formation of the fibrils, and insufficient amounts of mucous material only may remain for agglutinating purposes. There may be inadequate (both in quantity and quality) cementing material in the white fibrous tissue of many parts of the organism which are not subjected to prolonged or incessant activity; it is evident, however, that such constructive deficiency makes itself first and foremost felt in the habitually engaged parts of the motor apparatus. Deficiency in mucous substance of inelastic fibrous texture seems to be congenital in many instances; however, we shall see in what follows that it may also be an acquired condition. In this event an injury involving a relatively large area of adjacent structures may stand at its foundation; or chemical influences, not unlike to those artificially produced, may give rise to the more or less complete extraction of the agglutinating material. In some of these instances the chemical extraction very likely follows the trauma.

Lack of cementing substance may be readily demonstrated by the microscope as well as by the chemical extraction of the mucous elements. Under the microscope the white fibrous texture may appear as having been subjected to weak solutions of alkalis; the fibrils slightly swollen and loose; the homogeneous ground substance scarce. Treated chemically, but small quantities of extract containing little or no mucin at all are yielded. This deficiency, of course, cannot so readily be demonstrated during or after a rheumatic attack. In some instances even, the hyperemic condition of the invaded textures and the serous infiltration may prevent it altogether.

Congenital deficiency of cement may be accepted *a priori* to be as frequent as any of the other texture anomalies. The acquired condition may either precede the rheumatic attack, or it may be almost contemporaneous with it. It may be due to a variety of causes; among others, probably to an oversupply of calcareous material, as for instance during the formation of callus, or in the active stages of the growth of the individual.

If white fibrous tissue is the actual seat of the rheumatic process, then a deficiency in agglutinating material, in my opinion, is at least one of the essential factors in its causation. Inelastic fibrous texture lacking in cementing substance is more or less changed in its physical behavior. The principal alteration is the one of its permeability. Hence, changes in the permeability of tendons and ligaments, and especially of serous and synovial membranes, stand at the foundation of acute rheumatic fever.

The concentric progression of the rheumatic affection from adjacent fibrous textures towards and through the synovial enclosure—that is, to the point of least resistance—explains why the



rheumatic process is generally most severe within the synovial area. Thus it appears that the changes in permeability of the synovial membranes, or their analogues, are more marked than in the surrounding fibrous textures, or that in the joints their peculiar tubular arrangement and the synovia within favor the rapid extension of the rheumatic process.

Structurally, articular synovial membrane is almost entirely composed of connective tissue, of connective tissue corpuscles imbedded in the ground substance, of blood vessels and nerves. It differs, therefore, from the serous membranes in one point only, namely that its internal lining membrane is not formed by a stratum of epithelial cells, that is of real endothelium, but of a corpuscular layer which is of the same material as the underlying part of the tissue. However, the so-called mucilaginous glands, projections from the synovial membrane, contain besides fat cells, an epithelial lining. To the activity of these glands the special synovial secretion seems to be due. In both, the serous and the synovial membranes, the serum-transudation from the blood apparently occurs in a similar manner. But while in the former serum sufficient only to moisten the tissue is transudated, synovia serving lubricating purposes, is usually generated in much larger quantities. Besides, the two secretions differ in their composition, in so far as the synovia contains much more mucin than the serous fluid. Both have an alkaline reaction, contain various albuminous substances, and are relatively rich in crystalline bodies. Synovia is viscid and its composition varies according to the degree of activity of the joint, that is, the more the latter is exerted, the more its quantity is lessened, the more its organic ingredients increase and its inorganic components—water and salts—are diminished.

In acute articular rheumatism, the synovial fluid of the affected joint undergoes marked alterations. It is augmented in quantity and by the infiltration of large amounts of leucocytes it is converted into a turbid, thick liquid and its contents of albuminous substances, especially of fibrinous elements, is greatly augmented. The internal surface of the synovial tube is frequently coated with fibrin. There is little doubt that the fibrin-progenitors occur in relatively large amounts in the blood of rheumatic fever. We know that under normal conditions fibrin, which is an insoluble product, does not exist as such in the plasma; pathologically, however, fibrinogen by the action of fibrin ferment may be intravascularly transformed into fibrin. While fibrin may thus be found performed in the blood of acute articular rheumatism, it is probable that a part of it, at least, is produced in the serous effusion and the synovia.

According to Hammarsten<sup>18</sup>, fibrin ferment is the result of disintegrating blood corpuscles. The ferment, thrombin as it is called, however, is not the direct product of the corpuscular elements. These give at first rise to an inactive zymogen, the prothrombin, which in the plasma is converted

into the active enzyme. The transformation of the zymogen into the active ferment necessitates the presence of calcium salts. This conversion does not occur if the calcium salts dissolved in the plasma are precipitated by an oxalate. The indispensability of calcium salts in blood coagulation was first pointed out by Arthus and Pagés,<sup>19</sup> and all later investigators agree that the two factors, fibrinogen and calcium salts, are essential to the production of fibrin. They also concur in the acceptance of a third factor participating in the coagulating process, but there is no consensus of opinion as to the nature of this third factor. Inasmuch as the nature of the third agent does not especially pertain to the subject under consideration, I refrain from mentioning the various contentions advanced as to its origin and character.

The calcium salts play an important rôle in the process of coagulation. In the form of a phosphate, calcium is always present in the plasma as well as in the corpuscles. Calcium may occur, however, in the blood in a number of other combinations, for instance, as  $\text{CaCl}_2$ ;  $\text{CaH}_2(\text{CO}_3)_2$ , or as  $\text{Ca C}_2\text{O}_4$ .

Ringer and Sainsbury<sup>20</sup>, and some other observers obtained the most firm fibrin coagulum by treating blood with a 0.6 per cent solution of  $\text{NaCl}$  and by a weak solution of  $\text{CaCl}_2$ . There is ground for the belief that calcium chloride occurs in increased amounts in the blood just prior and during the height of the rheumatic process. Among the reasons justifying the assumption of an augmented quantity of blood,  $\text{CaCl}_2$  appears to be the already referred to diminished chlorine output by the urine before defervescence. The limited increase of chlorine compounds in the synovia and the serous exudate in rheumatic fever does not explain the marked chlorine deficit of the urine. Some of the chlorine, at least, seems to combine with calcium and magnesium and is retained in the organism. We know that in rheumatic fever the phosphates occur in the urine in more or less augmented quantities. The phosphates are mostly excreted as sodium compounds. The increased amounts of urinary phosphates seem to point to the retention of the chlorides in the blood.

We possess no definite information regarding any marked increase of calcium in the organism just before the onset of rheumatism; the excess of fibrin and other facts, however, strongly suggest an overplus of, or an increased reactive power of, the calcium salts of the plasma. The same salts of calcium which has given rise to the formation of fibrin, in all likelihood, has also dissolved the cementing substance out of the inelastic fibrous textures. It is even possible that an integral part of the extracted mucous substance, in this instance, serves as the third factor which is essential to the production of fibrin. If this is the case, then the involvement of the white fibrous tissue antedates the appearance of fibrin.

Proceeding upon the basis of these facts and interpretations, the following theory concerning

the origin and nature of the rheumatic process, may be formulated:

*The rheumatic process is possible only on the basis of increased permeability of white fibrous tissue contained in the habitually engaged parts of the motor apparatus, particularly in that of the serous and synovial membranes.*

*The altered permeability, or a predisposition to the same, may antedate the rheumatic involvement or it may be of synchronous or almost synchronous occurrence with the latter.*

*The augmented permeability of this tissue is effected by the calcium salts of the blood which extract the cementing substance from the fibrous texture.*

*Calcic bodies occurring in loose proteid combination in the blood are thrown out, deposited and temporarily retained in the articular tissues where their reactivity is displayed.*

*The precipitation of the calcium salts from the circulating blood must be due to its altered composition, which latter may have arisen through any physical or metabolic disturbance.*

*(The retention of chlorides in the blood and their replacing of the calcium molecule in proteid or other combinations, or likewise their union with the metal itself, may be one of the causes of the precipitation of calcic substances.)*

*The increased permeability may permit passage of such bodies which diffundate not at all, or with difficulty, only through the unaltered membrane.*

*Among the permeating substances we find fibrin whose occurrence is dependent upon the presence of calcium salts.*

*The hematic calcium salts aiding in the formation of fibrin very likely are identical with those which effect extraction of the cementing substance. (The extracted material may furnish the third element essential to fibrin production, and thus both processes may be of almost simultaneous occurrence.)*

*The passage through the texture and into the synovial tubes, or their analogues, and the temporary retention therein, of abnormal quantities of fluid and salts and voluminous bodies like fibrin—practically a state of disturbed osmotic equilibrium for the time being—is speedily followed by all the usual manifestations of acute articular rheumatism.*

With the aid of this theory, an explanation of the following facts and clinical features relating to rheumatic fever, may be attempted: (1) The hereditary transmission of the affection; (2) the proclivity to occur during a certain period of life; (3) the inclination to recurrence; (4) the abrupt onset; (5) the fluctuating pyrexia; (6) the synchronous and successive invasion of structures in different parts of the organism; (7) the self-limitedness.

(1.) The hereditary transmission of the affection. Inasmuch as a structural deficiency of non-elastic fibrous tissue stands at the foundation of acute articular rheumatism, and as this deficiency or its causative factors may have been transmitted

from parent to offspring, the latter is congenitally predisposed to the malady.

(2.) The proclivity to occur during a certain period of life.—It is an established fact that rheumatic fever infrequently befalls an individual during childhood and after the fifth decennary of life. Its occurrence is, therefore, almost entirely limited to that period of life, when the locomotor apparatus is subjected to its highest degree of activity. If acute articular rheumatism is an affection of the white fibrous tissue of the most actively engaged parts of the motor mechanism, then it is obvious that the disease, if ensuing at all, will make its appearance at that age when the latter is at the height of functional activity. The period of active systemic development, however, must often play a specific rôle in the production of rheumatism; likewise physiological decline, or at least its causative factors, must exert some influence upon the immunization of the organism.

Thus during adolescence, for instance, regeneration of white fibrous tissue may become more or less disturbed, or the surplus of calcium salts not utilized in osseous anabolism, may do injury to the fibrous structures—in fact, a variety of factors may convey the articular textures into a nidus for the disease. On the other hand, the atrophic condition of the tissues in advanced age seems to be averse to the production of rheumatic fever. Moreover, we are in some measure justified in speaking of abortive affections which by their occurrence prevent that of rheumatism. However, I have not in mind miasmatic diseases, or those supposed to be of bacterial origin, but such irregularities which are of a physical or chemical nature. A certain antagonism seems to prevail between the systemic state following the inoculation of vaccine virus and the rheumatic process<sup>21</sup>. Vaccination may thus prove a contributory agent in the prevention of rheumatic fever during childhood. A number of other conditions may temporarily preclude the occurrence of rheumatic fever. A factor inimical to the production of rheumatism, although not limited to early life, is phthisis pulmonum<sup>22</sup>.

(3.) The inclination to recurrence.—This is most natural when we consider that the substratum for the rheumatic process, once established, is likely to continue for protracted periods. The re-invasion of the joints may be due to similar etiological moments as have given rise to the original affection; however, each subsequent attack of acute articular rheumatism may be the result of a different exciting cause.

(4.) The abrupt onset.—Individuals hereditarily predisposed to the malady, after attainment of a certain age, are virtually subject to latent rheumatism, a condition characterized by more or less complete absence of rheumatic phenomena which latter may appear at relatively slight provocation. In instances where the anatomical substratum is performed, as likewise in those in which it is produced almost synchronously with the joint exudate, there can naturally arise but few and indefinite premonitory symptoms.



(5.) The fluctuating pyrexia.—The fever which reflects the intensity of the rheumatic process rises and declines accordingly. Temperature elevation may be dependent upon cement extraction and fibrin formation, or upon the passage of this or other pathological constituents through the periarticular and articular tissues. Reduction in temperature is due to the disintegration and removal of these substances. Temperature fluctuation results from production and deposition of abnormal or excessive material alternating with its decomposition or excretion.

(6.) The synchronous and successive invasion of structures in different parts of the organism.—In cases where the underlying defect already existed at the time of articular invasion a number of joints may become affected contemporaneously; in the event that tissue alteration and local inflammation almost concur, the shifting invasion peculiar to the affection will ensue.

Subsidence of the inflammatory process in one joint is most always followed by the active involvement of another. This characteristic phenomenon may be thus explained: The calcium salt causing extraction of cementing substance and fibrin formation occurs during a certain period in such quantities or in such a degree of reactivity as to involve but one joint, or a few at one time. Decline of the local invasion is due in some measure to the attack upon one or more fresh joints. Through this, the abnormal tension in the originally invaded joint becomes diminished. A portion of the exudated fibrin has been disintegrated in the meantime and its decomposition products, together with other organic and with inorganic infiltrators, have transpired through the skin, or have found their way back into the blood current from whence they are partly excreted and partly diffused through the newly-formed lesion.

(7.) The self-limitedness.—The definite course run by the rheumatic process is dependent either upon the extent of the pre-existing anatomical substratum and the activity of the fibrin-calcium factors, or upon the calcium salts alone. In either event, the attack may be expected to persist as long as the reactivity of the calcium salts is maintained.

It was not my intention to dwell in the foregoing upon the exciting factors of the malady. Of these there seem to be legion; indeed, the most insignificant causes may give rise to an attack in those, who on account of structural deficiency in the inelastic fibrous texture of the motor apparatus are peculiarly prone to it. In others, where there is neither an inherited nor an acquired predisposition to rheumatic fever, the primary stimulus is mostly of a more pronounced character. It appears as if one and the same exciting cause may give rise to the involvement of different structural systems in different subjects. Stimuli, analogous to those exciting an attack of articular rheumatism in one person, may provoke affections of an apparent discrepant nature in different individuals. Such affections are frequently but

slight deviations from the normal state, and their occurrence, I think, prevents that of rheumatism in many instances.

It was neither my purpose to inquire into the eventual relationship between the rheumatic process proper and the various direct and remote complications. Extension of the morbid process to the heart, that is to those structures which have their analogues in the joints, after all that has been said in the foregoing, cannot be called a complication at all. On the other hand, involvement of the endocardium which has no corresponding texture in the articulations, is a complication, seemingly due to specific factors. The same must be said of a number of other complications, principally of the very frequent tonsillar affections. These and kindred pathological conditions may be of bacterial origin, or they may furnish a nidus for the bacterial invasion of the organism. The various pathogenic micro-organisms whose occasional presence in rheumatic fever has been demonstrated by trustworthy observers may have thus gained entrance into the organism; acute articular rheumatism, as such, however, does not seem to be a bacterial disease.

I am cognizant of the fact that the theory propounded in the foregoing is hypothetical to some degree, and that it still requires elaboration in several respects; however, it is founded upon much less hypothesis than are both the bacterial and the lactic acid theories, and it explains the clinical phenomena much more rationally than either of them.

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### THE COMPLICATIONS AND SEQUELÆ OF ACUTE CROUPOUS PNEUMONIA.

BY H. A. HARE, M.D.,  
OF PHILADELPHIA;

PROFESSOR OF THERAPEUTICS IN THE JEFFERSON MEDICAL COLLEGE;  
PHYSICIAN TO THE JEFFERSON MEDICAL COLLEGE HOSPITAL;

AND

ARTHUR DARE, M.D.,

CLINICAL ASSISTANT, OUTPATIENT DEPARTMENT, JEFFERSON MEDICAL COLLEGE HOSPITAL.

ABOUT a year ago one of us (Hare) published in the *MEDICAL NEWS*, in conjunction with Dr. Landis, a paper on the "Sequelæ of Typhoid Fever" (see *MEDICAL NEWS*, June 15, 22, 29, 1901), which formed a sequel to a book upon this topic, published a year before on the same subject by one of the authors (Hare) of the present communication. The present paper is a study of the complications and sequelæ of another very common acute infectious disease.

General statistics in regard to every phase of croupous pneumonia are much diminished in value by reason of the fact that Boards of Health and physicians are not cautious in separating croupous pneumonia from catarrhal pneumonia, acute pneumonic phthisis, pulmonary edema, and even hypostatic congestion occurring in those various diseases in which this complication arises. The result of this is that the death rate under the term "Pneumonia" often represents a mortality produced by a number of severe pulmonary diseases and complications rather than that produced by one distinct malady. In the collection of the statistics contained in this paper the greatest care has been exercised to exclude as far as possible instances in which there was doubt as to the disease being true croupous pneumonia.

While we are wont to think of croupous pneumonia as a disease from which the patient dies or speedily recovers, rarely suffering any secondary affections, and while it is true that the malady does less commonly result in secondary manifestations than does typhoid fever, it is also a fact that the pneumococcus produces not infrequently interesting complications and serious after effects.

The symptoms manifested at the onset of an attack of croupous pneumonia depend largely upon the age, the temperament, and the constitution of the patient; his mode of life and the degree of severity of the infection. These various factors form the most valuable basis, upon which the diagnostician can determine the type of the invading malady, and so skilfully compare the relation between vital resistance and intensity of infection.

Thus a frank, sharp attack of pneumonia is usual in children and adults of good constitution, while the more insidious forms of the disease are very prone to seize upon the more delicate, and those whose vitality has been sapped by previous illness. Croupous pneumonia of the asthenic type usually occurs in persons of low vitality. In those of a neurotic temperament the infection most frequently presents numerous atypical symp-

toms; while the alcoholic subject manifests anomalous symptoms peculiar to his habit.

Rare between the ages of five and 14, croupous pneumonia progressively increases in frequency after the latter age, until it reaches the sixty-fifth year of life, when it is said to attain its maximum.

Croupous pneumonia is rarely observed in children under two years of age. Playfair<sup>1</sup> found only two cases in a series of 30 cases in children; Schlesinger<sup>2</sup> confirms this from an analysis of 173; and Holt<sup>3</sup> from observations of an equal number regards it as unusual prior to that age. Occasionally it is transmitted from the mother to the fetus through the placenta. Netter<sup>4</sup> gives the history of a sixth-para with a well marked croupous pneumonia, crisis occurring upon the sixth day; upon the ninth day the patient gave birth to a seven and a half or eight months' child, living and well developed; the child died when five days old, and an autopsy showed pneumonia located in the right upper lobe with fibrinous coating of the bronchi; bilateral fibrinous pleurisy; pseudo-membranous pericarditis, purulent cerebro-spinal meningitis and bilateral otitis. The right heart contained a fibrinous clot like that seen in the pneumonia of adults. Microscopical examination, as well as cultures, revealed the presence of encapsulated cocci, but no cocci could be found in the placenta or in the vessels.

Croupous pneumonia occurs most frequently in children at the age of four years, diminishing greatly after the fifth year, Holt having found but 13 cases beyond the age of five years in his series of 173 cases. Children of good constitution are most frequently infected with this form of pneumonia.

In a robust individual, a frank pneumonia is ushered in with a chill and an associated rise of temperature with pain in the affected side. There is noted a pronounced acceleration of the respiration. The rapid respirations and the slow pulse rate are pathognomonic of the affection. The temperature rises with marked rapidity to the fastigium, and is there maintained with but slight morning remissions, until the occurrence of crisis, although in some cases a temporary remission, called pseudo-crisis, takes place.

*Aberration in Onset of Disease.*—In distinction from this classical mode of outset it is interesting to study the atypical cases observed by many clinicians: Thus, Hood<sup>5</sup> observed a number of cases with pronounced hemoptysis as the initial symptom; and West<sup>6</sup> and Johnson<sup>7</sup> have subsequently reported similar cases. Of the series of cases mentioned by Hood, one half were true croupous pneumonia, occurring in individuals with an excellent family and personal history; while in the other cases, the hemoptysis and pneumonic infection appeared to be but the forerunners of grave pulmonary involvement of a tuberculous character. The cases which eventually proved to be uncomplicated attacks of croupous pneumonia and not tuberculous disease, be-



gan suddenly with hemoptysis accompanied with an elevation of temperature, with dyspnea and with the development of the physical signs of consolidation usually at the apex. In one instance occurring in a male thirty-five years of age, the patient began to cough while at breakfast, and was seized with a hemorrhage of a half pint or more of fresh blood; the hemorrhages were repeated from time to time and finally ceased with the defervescence of fever after the sputum had passed through the various stages of pigmentation from bright crimson to a prune-juice color. The left upper lobe was consolidated and presented the usual physical signs of croupous pneumonia; the disease ran a practically typical course and ended by crisis on the seventh day, the lung finally becoming entirely well. In two other robust males with the pneumonic consolidation located at the apex, profuse hemorrhage occurred at the onset together with a rise of temperature to  $101.5^{\circ}$  F., and the usual symptoms and signs of croupous pneumonia. The infection terminated by crisis about the usual period and both were discharged in a satisfactory condition. One of these men was two years subsequently accepted for life insurance by Hood. In another case described by the same author the shivering and fever of onset were followed by severe hemorrhage which he thought shortened the course of disease.

The case reported by West began with a flow of frothy bright-red blood, elevation of temperature and dyspnea. On the third day as much as five ounces of viscid blood were raised at one time, and the hemorrhage continued until death. On a postmortem examination of the lungs no cavity was found and no condition was discovered that would explain the occurrence of the hemoptysis except the hepatization of the left middle and lower lobes. Old adhesions of the pericardium and pleura were also found, together with recent vegetations upon the aortic and mitral valves. The left pleural cavity contained a pint and a half of turbid serum. The apex of the right lung contained an old calcareous nodule. The kidneys were normal. The question arises in such cases as these whether the consolidation of the lung is not due to the extravasation of blood.

The occurrence of gastro-intestinal disturbances is rarely seen at the onset of croupous pneumonia in the adult, though not uncommon in children. Smith<sup>8</sup> mentions a case in a man twenty-two years of age who had partaken largely of lobster salad. Six hours later he had a chill with vomiting and purging and a rise of temperature to  $105^{\circ}$  F. and a pulse of 140. Morphine was given to relieve the gastro-intestinal pain; the disease subsequently ran the usual course and ended in recovery. The gastro-intestinal symptoms were attributed to the lobster salad, and it is highly probable that such is the correct explanation, but it is interesting to note that Packard<sup>9</sup> observed two cases with very marked abdominal symptoms at the onset of the pneumonic infection.

In one case there was marked tympany but no pain; in the other a man of forty years was suddenly seized with violent pain in the hepatic and umbilical regions; the thighs were flexed upon the abdomen and the abdomen was exquisitely tender to pressure, and the right flank and hepatic region presented a marbled appearance with distention of the superficial veins. Examination under anesthesia revealed nothing abnormal. Pneumonic consolidation appeared the following day. No chill was observed; there was an entire absence of cough and expectoration throughout the course of the disease. The fever was moderate, respiration not much accelerated and no dyspnea was noted.

Edematous laryngitis appearing at the onset of croupous pneumonia is reported by Thornton<sup>10</sup> to have occurred in a woman thirty-five years of age. Infection was announced by a chill, dyspnea, sore throat and hoarseness. The larynx was examined with great difficulty owing to a swollen condition of the epiglottis. The dyspnea was so urgent that tracheotomy was performed. This afforded instant relief, but the temperature, which previous to the operation was  $101^{\circ}$  F., immediately rose to  $105^{\circ}$  F. After the lapse of 64 hours the tracheotomy tube was removed the laryngeal edema having subsided to the extent that normal respiration was possible. Crisis occurred upon the seventh day. The urine was albuminous for three days.

Dorange<sup>11</sup> mentions the case of a man twenty-eight years of age, in whom tracheotomy became necessary to relieve the dyspnea. Pneumonia developed and ran its usual course to complete restoration to health. One month later a second pneumonia developed involving the same region as was first attacked.

An unusual case of purpura hemorrhagica was observed by Jaworski<sup>12</sup> in a man aged twenty-seven years, at the onset of croupous pneumonia with the consolidation occupying the middle lobe of the right lung. While making an excavation the patient was seized with a severe chill followed by profuse bleeding from the nose and mouth and loss of consciousness. On the following day the hemorrhage was repeated several times, and in addition pain in the right side of the chest, general weakness and depression manifested themselves. The skin was pale and somewhat moist. Upon the lower part of the body, from the umbilicus downward, were numerous subcutaneous hemorrhages, varying in size from a pinhead to a lentil. There were also hemorrhages beneath the conjunctivæ, into the sclera and beneath the mucous membrane of the inferior surface of the tongue and lower lip. Neither the gums, palate, nor larynx presented any changes or lesions. The tongue was dry and covered with a coating with which coagulated blood was mixed. Blood constantly trickled from the nose. There was considerable frothy, blood-stained expectoration. The urine was blood-stained and contained red corpuscles. The patient grew progressively worse and died in five

days from exhaustion. The history and symptoms excluded phosphorus poisoning, arsenical poisoning, scorbutus and typhoid fever. The necropsy confirmed the diagnosis of croupous pneumonia complicated by purpura hemorrhagica. Bacteriological examination was not made.

Retention of urine, though not of common occurrence in the onset of croupous pneumonia, is mentioned by Johnson<sup>13</sup> as having been observed in two brothers with neurotic family history. Brothers and sisters of the patients were affected with petit-mal, epilepsy and impediments of speech. In one of the brothers, a lad of nineteen years, hemoptysis occurred at the onset and lasted for two days; complete retention of urine was present from the first, and catheterization was necessary three times a day for six days during the height of the infection. After the defervescence of the fever the urine was voided normally. The consolidation was located at the right base and complete recovery resulted. In the other brother, twenty-two years of age, blood-streaked sputum, high temperature and complete retention of urine appeared simultaneously; catheterization was necessary three times a day for nine days, pneumonic consolidation occupied both vases. The disease terminated in recovery.

Fernet<sup>14</sup> describes croupous pneumonia and herpes zoster appearing simultaneously; herpes of the palate and throat and also of the nose and external genitals. On the right side of the chest along the course of eighth intercostal nerve, herpetic vesicles developed which remained until the fourteenth day, eight days after the crisis. The pneumonic consolidation occupied the right lower lobe.

In early childhood, the initial chill, so constant in the adult, is but rarely observed at the onset of croupous pneumonia, but vomiting and various gastro-intestinal disturbances, or nervous manifestations, such as convulsions, twitching of the muscles and coma are frequently observed. In many cases the nervous symptoms predominate and assume such a marked resemblance to meningitis, or cerebro-spinal meningitis, that in the beginning the diagnosis is by no means clear, the absence of cough, and the late appearance of the physical signs only adding to the confusion. Various theories have been advanced to explain the profound nervous symptoms. Aufrecht<sup>15</sup> believes that the production of profound nervous symptoms are the result of edema of the brain brought about by a change in the composition of the blood, or by obstruction to the return of venous blood from the brain by the apical consolidation. This latter theory is not entirely borne out by the clinical experience of others, as in Russell's<sup>16</sup> case of cerebral pneumonia with well marked nervous symptoms, the consolidation occupied the right lower lobe. Playfair has not observed profound nervous symptoms in apical pneumonia more frequently than in those occupying the base, and some think that such an occurrence does not take place because the nervous symptoms appear at the onset at a time when the physical signs can-

not be discovered for several days. Our experience is that mental symptoms and apical lesions are commonly associated in children. Frequently the nervous symptoms subside with the development of physical signs. Holt's experience leads him to believe that the proportion of lung involvement has little influence upon the production of nervous symptoms. The recent advancement in the study of pneumococcus infection tends to show that the toxemia and not the proportion of lung involvement is responsible not only for the marked nervous manifestations, but also for the dyspnea and great acceleration of the respiration.

Two apparently distinct types of meningitis are found as complications of croupous pneumonia; one appearing at the onset of the disease, the other during the active or post critical stage. The former variety is seen most frequently in children, and is probably symptomatic; it is rarely fatal, and therefore its pathology is somewhat uncertain. On the contrary, meningitis developing during the course of the well developed infection is generally the result of meningeal infection, and is very frequently associated with endocarditis, as pointed out by Osler, or by diffuse metastases.

Numerous cases are on record of croupous pneumonia in children which at the onset simulated meningitis, cerebro-spinal meningitis, and even hemiplegia. But the subsequent appearance of local physical signs, the pulse and respiration ratio and the crisis, marked a sudden fall in temperature about the eighth day, confirm the diagnosis of croupous pneumonia. The favorable termination in many of the reported cases has not permitted an adequate pathological investigation, although meningitis due to the pneumococcus, is well recognized. In Wublad's<sup>17</sup> case, terminating fatally, no autopsy is recorded. Russell recorded a case of cerebral pneumonia occurring in a boy of ten years of age in whom the initial symptoms were intense headache, nausea, and vomiting of a greenish fluid, and the appearance of herpes at the angle of the mouth. On the fifth day physical signs were discovered occupying the right lower lobe. Crisis occurred upon the seventh day and convalescence was established and progressed favorably to complete recovery.

Wublad records a fatal case occurring in a child two years of age, who presented well marked symptoms of meningitis beginning with convulsions several days prior to the development of physical signs. Starr<sup>18</sup> mentions a case of cerebral pneumonia observed in a boy 17 months old with a family history of tuberculosis disease in which the infection became manifest by anorexia, vomiting, diarrhea, and slight cough; the child showed some tendency to retraction of the head, and often awoke crying and sometimes screaming, *tache méningéale* was absent; the pupils were equal and reacted to light, but twitching of the hands and arms was noted. Upon the appearance of the physical signs in the right upper lobe the meningeal symptoms began to abate.



Tuberculous meningitis was first suspected, but was subsequently excluded by the absence of squinting, irregularity of the pupils and the *tache méningéale*, and by the presence of cough and the characteristic rapid respiration in relation to the comparatively slow pulse rate.

Raven<sup>19</sup> describes a case of cerebral pneumonia in a boy of seven and a half years, beginning with rigors, pain in the head, bilious vomiting, delirium and restlessness on the 15th day. Indistinct physical signs were apparent at the right apex, insensibility, widely dilated pupils, and convulsions. The infection ended by crisis on the eighth day. Fenn<sup>20</sup> observed pronounced meningeal symptoms in a girl two years of age. Fever and loose bowels appeared at the onset, together with stupor, tossing of the head, staring eyes, and divergent strabismus. Later the child became rigid. On the third day signs of consolidation appeared at the right apex. *Tache cérébrale* was well marked, and the temperature reached 104° F. On the sixth day the temperature fell to 96° F. with improvement in the meningeal symptoms, but on the seventh day they reappeared. Hood<sup>21</sup> mentions several cases occurring in children in which severe cerebral symptoms began at the onset; the lung lesions were located at the apex. Morris<sup>22</sup> describes three cases simulating meningitis; in the first case the upper lobe was involved; in the second physical signs did not appear until the sixth day, and were then discovered in the right upper third; in the third case the physical signs were equally late in their appearance. These cases were characterized by stupor lasting about seven days, with occasional attacks of screaming, delirium and vomiting. The muscles of the neck were rigid, and thighs flexed upon the abdomen, which was distended and tympanitic. All of them recovered.

Preble gives the history of case in which meningitis, pericarditis and multiple arthritis were associated. The patient, a female forty-three years of age, suddenly developed severe frontal headache and vomiting, the latter continuing for 36 hours. There were well-marked delirium, rigors, pain, and redness of the joints. The urine contained a trace of albumin, fine and coarse granular casts. The pupils were unequal, the right being the largest; both reacted to light however. There was rigidity of the neck, but no paralysis. Kernig's sign was absent. There were slight external strabismus, right-sided ptosis, choked discs, and the head was turned to the right. Lumbar puncture revealed extracellular pneumococci. Both bases were the seat of pneumonic consolidation. The heart was normal with the exception of accentuation of both sounds. Pericardial friction was noted. Puncture of the left wrist joint revealed the presence of pneumococci in the whitish muco-pus that exuded. Smears of the blood also showed the presence of pneumococci. The autopsy revealed a small purulent pericardial effusion. Involvement at both bases and an old healed tuberculous nodule at the right apex. The kidneys showed acute degenera-

tion, the brain a diffuse purulent meningitis, and the joints a multiple arthritis. Bacteriological examination showed pneumococci in the blood, pericardium, meninges and in the joints.

In another case observed by Preble, there were purulent cerebro-spinal meningitis, acute endocarditis, pulmonary edema, and cloudy swelling of the kidneys at necropsy. The following clinical history was obtained: The right eye was closed; the heart was normal, as was also the spleen. Friction and dullness were heard over the left lower lobe. The liver was slightly enlarged. The pulse was 80, temperature 102° F., respiration 32, all rising gradually until death.

*Complications During the Course of the Disease.*—The complications arising during the course of croupous pneumonia are alike in the adult and in the child, generally being pneumococcus infections or intoxications. While each decade of age seems to have its characteristic train of nervous manifestations, the complications appear in both with such a uniformity as to exclude separation into the complications of children and adults. The complications occurring during the course of the disease are also grouped not according to age, but classified according to the anatomical location of the lesion.

In many of the cases of pericarditis occurring in the course of croupous pneumonia, the edge of the lung overlying the pericardium is found in a state of pleuro-pneumonia, and for this reason pericardial involvement is supposed to be due, in many cases, to direct extension; it may also be the result of general infection or metastasis by the blood vessels. The existence of pericarditis may be unsuspected during life and only discovered postmortem. There are no early characteristic symptoms but pain and precordial distress are sometimes present. The diagnosis must be made chiefly from the local physical signs. Friction may be heard in dry pericarditis or before effusion is considerable. When the accumulation is extensive, definite increase in the area of cardiac dullness is clear. Not rarely, however, the presence of either of these complicating secondary infections may be unsuspected during the patient's life. Thus Thayer<sup>23</sup> was only made acquainted with the presence of pericarditis in one of his cases of croupous pneumonia, when the autopsy disclosed a thick layer of pyogenic membrane over the visceral pericardium, with a large quantity of pus in the pericardial cavity. In Manges<sup>24</sup> case, in which the right base and left apex were affected, the disease followed the typical course until resolution occurred. At this time a friction murmur was discernible at the base with an irregular pulse. About the 23d day there was an acceleration of the heart beat and symptoms of sepsis were apparent. One week later the following phenomena were observed: pronounced dyspnea, vomiting, irregular pulse, and a marked increase in the area of cardiac dullness. Paracentesis was performed and eighteen and one-half ounces of fluid were removed. An examination of this exudate showed that it con-

tained a pure culture of Fränkel's pneumococcus. Relief was temporary, but rapid recovery followed the operation of pericardiotomy, when forty ounces more of the fluid were removed from the sac. In the case of Fawcett and Steward<sup>28</sup> the disease was marked at the right base. Friction sounds were absent. Ten days later exploration was decided upon owing to a marked increase in the area of pericardial dullness. Upon pressure an exquisite tenderness was elicited over the epigastrium. Exploratory puncture revealed the presence of pus. A portion of the fifth costal cartilage on the left side was removed; the infected area was incised and drained. Fourteen days later an empyema, small and localized, and due to streptococcus invasion was discovered on the right side. The autopsy showed that the pericardium was rapidly clearing up. Sturgis<sup>29</sup> has reported a case of pronounced pericarditis in an alcoholic who suffered from the graver nervous manifestations, so often encountered in persons addicted to alcoholic excess. Venturi's<sup>37</sup> case had a meningitis complicating the pericarditis. Convalescence proceeded until the 16th day, when rigors occurred in conjunction with an elevation of temperature which was the warning signal of an effective process. This infection proved itself to be pericarditis, associated with a meningitis. The exudate was proved to contain the pneumococcus by culture tests and by the subsequent inoculations of rabbits with this exudate. It may furthermore be stated that in an elaborate study, Myers<sup>38</sup> has found that in 500 cases, 58 per cent. were bilateral and that 27 per cent. resulted fatally. Pericarditis was observed in 11 of these cases and endocarditis was present in 41 cases. Of these the mortality was 40 per cent. At the Mt. Sinai Hospital out of six cases of pyopericarditis, there were three recoveries. Satterthwaite<sup>39</sup> has reported 55 fatal cases of croupous pneumonia, death in 10 of these cases being directly attributable to the involvement of the pericardium.

As has just been observed the occurrence of endocarditis is a not infrequent and important accompanying condition of croupous pneumonia. In Sainsbury's<sup>40</sup> case, three days after the termination of the pneumonia, there occurred rigors, elevation of temperature, profuse sweating and pain in the left axilla; there was a daily chill and an exacerbation in the temperature to 103° F. or over; falling again rapidly. There was absence of tubercle bacilli in the sputum. At the 20th day a blowing sound was heard at the base, which was systolic in time. Exploratory puncture of the pleura revealed some blood-stained fluid. The temperature rose to 105° F., with coldness and lividity of the extremities. Examination of the eyes revealed unequal pupils, external strabismus, and an absence of optic neuritis. Before death the temperature attained a height of 106° F. The autopsy showed a healthy brain, with the lesions of meningitis, especially well marked upon the convex surface; no actual pus could be found. The heart was softened and

showed friability. Greenish vegetations were present upon the aortic segments, complicated by a small aneurism of the valve. The lungs showed the usual pathological changes incident to this infection. There were dense pleural adhesions upon the right side. Microscopically there were found a large number of short bacilli all of one kind, arranged end to end or in short chains. The meningeal exudate showed the presence of pus cells and a limited number of various microorganisms. Cultivation yielded the *staphylococcus pyogenes aureus*.

A case of pyopericardium complicating pneumonia reported by McConnell<sup>41</sup> had the following history: The patient, aged thirty-three years; crisis occurred on the ninth day. On the day following there was evident a pericardial friction sound, with absence of endocardial murmurs. On the twentieth day there was found a large pericardial effusion, which gradually increased with an abatement of the pulmonary symptoms. Pericardial dullness extended from the upper margin of the second rib above, to the liver below; the latter was depressed about two inches. At the level of the fourth rib, the dullness extended from a point one and three-quarter inches to the right of the sternum, to a point one inch to the left of the nipple. The patient was unable to swallow solid or liquid food, as it produced pain and frequently regurgitation through the nose. Paracentesis was performed and six ounces of creamy pus were removed, Fränkel's pneumococcus was found in pure culture. The fluid gradually reaccumulated; incision was performed, and sixty-six ounces of pus were evacuated; a drainage-tube was inserted and improvement took place. There was little constitutional disturbance.

Garrod<sup>42</sup> made cultures from the pus in the middle ear and from the heart's blood, and found colonies of pneumococcus, some streptococci and the *bacillus coli communis*. Sections of the cardiac vegetations revealed numerous diplococci. Septicemia with ulcerative endocarditis is discussed by Purser,<sup>43</sup> who found that the crisis upon the ninth day was associated with partial collapse, and that 10 days later, a murmur in the aortic area, systolic in time, was present, which became progressively louder. Prostration, delirium, and pyemia ushered in the fatal termination. Much interest was centered in the autopsy; encapsulated pneumococci were present in every organ under examination. Adhesions had completely obliterated the pericardial sac. The auricles were soft and friable. The right posterior cusp of the aortic valve was filled with vegetations and revealed a perforation. Marked splenic enlargement with infarcts were observed. An infected embolus showing the presence of pneumococci was discovered in the primary branch of the splenic artery. Finley's<sup>44</sup> case pointed strongly to the existence of a malignant endocarditis when he found that two distinct rigors had taken place upon the 11th day of the disease. In this case large polypoid vegetations were massed upon the tricuspid valve with ab-





months in pregnancy, had, in the third week following, a pneumonia that terminated by lysis, marked dyspnea, and displacement of the heart. Aspiration was performed and two pints of sweet pus were removed. The temperature gave no evidence of purulent effusion. In the second patient there was displacement of the heart. Aspiration was resorted to and one pint of sweet pus was drawn off. The following day two additional pints were removed. In a third case, four ounces were obtained by the hypodermic needle. In a fourth patient with violent maniacal delirium, three pints of pus were aspirated and the chest freely opened. Hood's next two patients ran a typical course for a week and ten days respectively. In neither case was a septic temperature evidenced. In the one instance a pint of sweet pus, followed the next day by the removal of two additional pints; in the other case four ounces were aspirated. The last of this series was a case in which convalescence was interrupted by pericarditis. On the 28th day of the disease a cough, resembling whooping-cough, developed; a free opening on the 35th day was resorted to and three pints of pus were aspirated.

Penzoldt<sup>41</sup> says that in a number of cases where empyema was the complication, the infection presented a most severe type. In some of these cases the characteristic temperature fall, indicative of the crisis, failed to evince itself, but as is often the case, nothing else pathological presented itself to cause a suspicion of the presence of pus. He believes when dullness continues, it is imperative to explore, especially when in conjunction with this physical sign is found associated persistent bronchial breathing with evidences of some fever and loss of strength and flesh.

Drummond<sup>42</sup> makes mention of a case which illustrates the value of puncture in obscure cases. In the second case, a male, aged nineteen years, had an exacerbation of temperature on the seventh day. There were then noted restlessness, delirium, cyanosis, and physical signs pointing to involvement of the right middle and upper lobes by extension. Lysis began on the eleventh day. Exploration of the chest was performed and pus obtained. Paracentesis was determined upon and thirty ounces of pus were withdrawn. A negative result was obtained by puncture upon the fourth day; the same result was given eight days later. Gradually the dullness disappeared. The patient made a good recovery. Bradley's<sup>43</sup> case had croupous pneumonia with pleural involvement. The patient gave a history of alcoholism, and there was bulging of the chest wall, with dullness on percussion. Aspiration failed to give any evidence of fluid accumulation. Three days later the temperature rose from 100 to 103.2° F. Twenty days following the crisis, pus was evacuated through a bronchus. Eight ounces were expectorated in the 24 hours, gradually decreasing until the 13th day, when it ceased entirely. After rupture, the convalescence progressed favorably.

Luigi Mazotti<sup>44</sup> tells of three robust men of thirty-four or thirty-five years of age in whom empyema revealed itself two days after deferescence. In all three cases, the pus burrowed its way into the bronchial tubes without any evidence of pneumothorax, and in three or four months perfect recovery ensued. In one case, that of an enfeebled man aged sixty-two years, the case terminated fatally. Chills and pains were absent and there was but little dyspnea. A creamy pus, greenish but odorless, was found. Croupous pneumonia followed by empyema, with crisis upon the tenth day, without amelioration in the general symptoms is recorded by Holt<sup>45</sup>. The patient, a girl of two years of age, presented exaggerated breathing over the left lung, and a markedly dull note, amounting to almost actual flatness, with the exception of the extreme apex, where percussion elicited tympany. There was displacement of the heart to the left. Pus was discovered by exploratory puncture. A half pint of pus was evacuated by incision. Improvement was evident for a few days, followed by a fluctuation in the temperature curve between 103° and 105° F. for a period of five days, at the end of which time the pneumonia terminated fatally on the 21st day of the illness.

#### *Gangrene and Abscess Formation in the Lung.*

—These are two very important and serious lesions which unfortunately are not of uncommon occurrence in connection with cases of croupous pneumonia. Eisendrath<sup>46</sup> has analyzed 96 recorded cases of pulmonary abscess, gangrene and bronchiectasis following croupous pneumonia. When the totals are computed as to percentage of recovery, the result is quite striking, especially in the more acute cases; they are as follows:

	Cases.	Recovered.	Impd.	Died.
Acute simple abscess.....	35	96.0	4.0	.....
Acute gangrenous abscess.....	26	71.4	7.2	21.4
Chronic simple abscesses.....	14	42.8	21.4	35.8
Chronic putrid abscesses with bronchiectases.....	26	50.0	15.3	34.7

Eisendrath found from his review of the subject that the symptoms usually came on after the crisis and consisted in a post-critical rise in temperature which then became remittent in type. The sputum became purulent, and there was a distressing cough accompanied by expectoration of pus in large quantities. If the abscess cavities do not communicate with a bronchus, there is but little expectoration. There is in all cases emaciation, loss of appetite and a rapid decline in strength. If the abscess becomes chronic, there may be recurrent attacks of fever, with a great deal of expectoration.

Physical examination is rather disappointing. The pulmonary lesions following pneumonia are most frequently in the lower lobes, and this is of some aid. There are no typical physical signs, owing to the fact that the cavities, be they due to abscess, gangrene or bronchiectasis, may be near the surface, or quite deeply situated, and may or may not communicate with a bronchus. Dullness, decreased respiratory murmur, vocal resonance and fremitus are present in the majority of



cases, but we may have bronchial breathing. The most reliable sign is the presence of large, moist râles, not infrequently metallic in character. Another striking feature is the variability of the physical signs, ~~the~~ one time dullness and then tympany at the same spot. Clubbed fingers develop quite early, as do also pressure symptoms on the heart, liver and spleen.

Gangrene must be suspected when there occurs a rise of temperature, a few days after the crisis, and the breath becomes fetid. The sputum is also fetid and divides itself into the characteristic three layers.

In bronchiectasis following pneumonia, the sputum may be fetid at times, but the odor is not so penetrating and there are no elastic fibers.

The physical signs of the three conditions are very similar. In bronchiectasis there is usually a history of long-continued expectoration of large quantities of pus. This, however, is not characteristic, for the same may be true of chronic simple abscess. The frequency of hemoptysis in cases of gangrene is due to the fact that the vessels are more apt to pass freely through the cavity, owing to the more rapid destruction of tissue.

The following two cases reported by Holt<sup>47</sup> of gangrenous termination of croupous pneumonia are not without interest:

*Case 1* was that of a female, aged two years, who had a maximum temperature of 106° F. On the sixth day friction sounds were recognized over the right upper lobe with indications of extension into the middle lobe in front and the lower lobe behind. Upon the seventh day pronounced prostration was present which gradually became intensified until the occurrence of death, upon the 12th day. Autopsy: The right chest contained 16 ounces of sweet pus, which occupied two cavities; the smaller one just below the sternum contained only half an ounce. The visceral and parietal layers of the pleura were covered with a thick, shaggy layer of fibrin and pus. The only abnormality found in the right lung was compression of the lower lobe. The entire upper lobe and upper half of the middle lobe had undergone hepatization and presented a brownish-red color. Upon section, the upper lobe revealed three or four gangrenous areas occupying the center of the lobe. The largest of these had a diameter of three-quarters of an inch. An evident antemortem thrombosis had occurred; there being discovered in the largest artery that led to this region and adherent to it a thrombus with white fibrin. A wedge-shaped gangrenous area presented itself at the lower border of the upper lobe, which extended to the surface of the lung. A similar thrombus was found in the vessel here. Some edema of the left lung above was apparent with congestion below. Microscopical examination of the lung showed preponderance of the fibrinous elements, the alveoli presenting but few round and epithelial cells.

*Case 2.*—Male, three years of age. After one week's time prostration became extreme and in

two weeks terminated fatally from pulmonary edema. There was no expectoration, no fetor, no dropsy, and no variations from the normal amount of urine passed. Upon postmortem there was found a sacculated pleurisy, occupying the lower and posterior regions of the right chest, containing five or six drams of a dirty-brownish serum. Throughout almost their entire extent both lungs were adherent to the chest wall. The left lung was adherent to the diaphragm. The heart was not displaced; the pericardium was normal. The right lung was covered with a thick false membrane, which could be readily stripped. No crepitation at the lower half of the lung was present. It had a solid consistency and sank in water. The diaphragmatic surface showed two irregular circumscribed, dark-gray patches, softer than the surrounding tissue. Gangrenous patches, varying in size from a pea to a walnut were scattered throughout the lower lobe. There was neither a gangrenous odor nor any obstruction to the vessels. About four-fifths of the lower lobe was gangrenous and when washed with water, exhibited a honey-comb appearance. The left lung was congested and covered with thin false membrane; there was no enlargement of the bronchial glands. Heart walls and valves were normal; there was found a fatty enlarged liver and marked splenic enlargement. The kidneys were almost adult size and showed changes incident to acute parenchymatous nephritis; albumin was present in the urine in the bladder. Microscopically: Large quantities of epithelium from the pelvis of the kidney and also from the kidney itself and from the bladder were present. There were likewise found epithelial, hyaline and blood casts. Tubercles could not be demonstrated.

In Perry's<sup>48</sup> case of gangrenous pneumonia in a man aged forty-five years, there occurred hemoptysis and pyrexia. Death was apparently produced by internal hemorrhage. Influenza probably brought on the attack of pneumonia. At the autopsy 52 ounces of clotted blood were found in the right pleural cavity, which communicated with the lung by a small opening.

Goelet's<sup>49</sup> case gave a history of alcoholism. A male, twenty-three years old, on the 16th day of the attack developed offensive expectoration. In a short time unmistakable symptoms of pulmonary gangrene appeared. The patient recovered.

In Squire's case, a male of thirty-four years, pleuritis occurred, but resolution failed to evince itself at the usual time. During the middle of the fourth week there was fetor of the breath; the sputa was purulent and of an emerald green hue. It exhaled a fetid odor; violent paroxysms of cough were present, and upon one occasion expectoration of one pint of this sputum occurred. Five months later the man was apparently well and was occupied at his usual vocation.

In Thorp's case,<sup>50</sup> a boy of fifteen years, pulmonary gangrene began upon the seventh day.

In Brookhouse's<sup>51</sup> case the patient enjoyed but

a partial recovery. Two months later dyspnea developed, with violent paroxysms of coughing and expectoration of a dark-colored, fetid, purulent fluid. A large cavity was discovered at the base of the left lung (the upper lobe was normal). Upon aspiration a violent explosion of air occurred with the escape of three drams of fetid pus. The case ended fatally at the end of the third month. Postmortem examination showed the right lung in its entire extent adherent to the chest wall. The upper lobe of the left lung was free from adhesions. The lower lobe was so densely attached, that in efforts of removal the tearing of the dense adhesions rent the tissue asunder. A cavity of the dimensions of a cup, occupied the whole of the left base; the wall was smooth and was free from pus. Adjacent lung tissue was almost black and solid. The right lung was engorged and edematous. On incision at the base, pus could be forced out. A male patient, aged thirty-nine years, is reported by Fisher<sup>62</sup> as presenting the following signs: Decidedly albuminous urine was present with the usual symptoms characterizing the typical onset and early course. Upon the 14th day, the sputa had a decidedly gangrenous odor. Dulness extending to the base, with amphoric breathing at the upper and middle third was present. There was also pectoriloquy in this situation. There were marked remissions and exacerbations in the temperature, variations attendant upon copious and exhausting sweats. Upon the 23d day the temperature became normal, and convalescence began, with resulting pulmonary resonance over the entire right lung. The patient recovered.

De Jersey<sup>63</sup> treated a child twenty-one months old with a tuberculous family history on both sides of the family. Eight weeks antecedent to the attack the child was a sufferer with severe attacks of dyspnea, anorexia, fever and cyanosis of the lips. There was absence of expectoration. Wooden dulness over the whole left chest, but no cardiac displacement was present. The left chest was one quarter of an inch larger than the right. Exploration was performed and fetid pus evacuated to the extent of one dram. The temperature fell after the withdrawal. When the dressing was renewed, a thick brownish discharge of offensive odor was noted. Offensive diarrhea and vomiting were present. Forty-eight hours before death the breath became extremely offensive and fetid. At the autopsy the left lung was found solid, and the tubes were widely dilated and thickened, and contained a large amount of pus. Gangrenous patches were scattered over the lung, emitting a fetid odor. The pleura was everywhere adherent. Bronchitis was discoverable in the right lung. No tubercles, emboli, or thrombi were present.

Syers<sup>64</sup> case was that of a lad of eleven years, who developed marked dyspnea upon the sixth day. Pain in the right axillary region became suddenly apparent; there were also present coughing, retching and vomiting, resulting in the

expulsion of large quantities of extremely offensive pus. The breath gave out a fetid exhalation. A cavity was discovered at the apex of the right lower lobe. The temperature fluctuated between 101° and 102° F. with much diaphoresis at night. At the end of one month temperature became normal and recovery rapid. Microscopical examination revealed pus corpuscles and elastic fibers in the pus.

Edson<sup>65</sup> has reported a case of a girl aged eight years, where delayed resolution was observed. For weeks the patient had been lying upon the affected side, and exhibited the following well marked symptoms: Suppressed cough, scanty frothy mucus, and a small amount of tenacious yellow sputa. The urine was scanty and albuminous, and there was edema of the feet. Between the first and second rib and three-quarters of an inch to the right of the sternum, an abscess was discovered, about the size of a hickory nut. The walls were thick and firm, affording a synchronous expansion and contraction with the respiratory movement. Five days later a still larger abscess was observed, occupying a position one and one-half inches below the right nipple; the following day rupture occurred, resulting in the discharge of two pints of pus; this exudate spurted from the orifice when the patient, by forcible expiratory efforts, brought on a paroxysm of cough, and when the cavity was void of its contents there was noted the free passage of a current of air, which effected its way through a bronchus, and thence to the trachea. There was a complete adherence of chest wall and pleura. Pus could not escape internally. The first abscess to appear was the first to disappear, resulting in a marked improvement in the patient's condition. In one month the child was up and about and in four months complete recovery was reported.

Molson's<sup>66</sup> patient perished upon the eleventh day. The patient, a female of thirty-five years, began the expectoration of a very offensive purulent exudate upon the tenth day of the disease, accompanied by a drop in the temperature from 104° to 99° F. Upon postmortem the following changes were observed: Extensive pneumonia of the right lung, the lower lobe presenting at its lateral aspect the existence of a large ragged abscess cavity. Serous membrane involvement was disclosed in the recently inflamed pericardium; the right side of the dura mater showing internally the presence of a thin film of inflammatory lymph.

Elsner<sup>67</sup> has reported two cases. The first of these was an attack of croupous pneumonia, in a man of thirty-four years, with marked cardiac asthenia. The patient stated that he was of temperate habits. Four days following crisis, there was thought to be in the middle lobe of the right lung an accumulation of pus. This was confirmed by exploratory puncture, the abscess cavity was incised and drained and perfect recovery resulted. In the second case reported by this physician, the patient, a man of twenty-six



years, gave a distressing previous history. Addicted to the continuous use of cocaine, a slave to absinthe, giving a clear history of specific disease and alcoholic excesses, though no existence of a tuberculous diathesis, the patient suffered an attack of delirium tremens upon the third day of the disease. Microscopical examination revealed pneumococci and staphylococci in the sputum upon the sixth day of the disease, with profuse perspiration and the occurrence of crisis. The delirium tremens at this time became markedly modified, the mind becoming clear a few hours later. Upon deep inspiration, intense pain was experienced at the infra-scapular and infra-axillary regions of the right side. Elevation of temperature to 104° F. with a well defined chill occurred subsequently, with the re-occurrence of symptoms indicative of delirium tremens, in conjunction with a short and unproductive cough. Involvement of the left apex intensified the symptom-complex upon the tenth day; leucocytosis which had disappeared upon crisis again evinced itself, and the presence of bloody sputum was observed. Exploratory puncture revealed the existence of pus in the right lung, but a negative result followed incision of the pleura; a few pleural adhesions could be demonstrated. At the most dependent part of the base an abscess could be detected. A half-pint of dirty, fetid pus was evacuated, and this was followed by the institution of drainage, which was continued for about two months. Recovery was reported. This same physician in a series of 150 cases of croupous pneumonia, finds the occurrence of abscess formations in but three cases, and Sello<sup>ss</sup> who has collected 750 cases, reports that in them he has found 11 instances of abscess, thus giving a percentage of 1.5.

(To be Continued)

## MEDICAL PROGRESS.

### OBSTETRICS AND GYNECOLOGY.

**Myomata and Pregnancy.**—The decision of the operability of fibromyomata of the uterus is difficult even in the presence of modern advanced technic, but when pregnancy occurs to complicate the proposition the seriousness of the clinical question is enhanced. Submucous myomata by altering the endometrium usually prevent conception; subserous forms have no effect on impregnation but may interfere with later pregnancy and delivery, while interstitial masses especially about the lower segment of the corpus or in the cervix commonly cause very great obstruction in the parturient passage. Dr. URICHIN of Charkow (*Cblatt f. Gynäk.*, 1902, No. 25) briefly reports such a case: The thirty-five-year-old woman began menstruation at sixteen years of age and continued it normally; married at twenty-six, when painful and profuse menses began; in May, 1901, bleeding began and persisted eight weeks; last period Sept. 10, 1901. Pregnancy present with vesical symptoms. Palpation disclosed a goose-egg-sized subserous tumor near the fundus on the right, and another hard mass on the posterior aspect of the organ; and the fetal head in the anterior vaginal fornix. Auscultation showed the uterine souffle and fetal heart sounds. The urine contained albumin, casts and renal elements. Diagnosis: fibromyoma uteri gravidi cum

nephritis. Without this complication the pregnancy would have been allowed to terminate and a Caesarian section undertaken. Interference was however undertaken at once. The uterus was amputated just distal to the internal os so as to remove another tumor in it. The recovery was complete. One mass was sarcomatous.

**Folliculoma Ovarii.**—This term was first suggested for all those tumors of the ovary where one finds certain cells resembling egg cells. W. E. FOTHERGILL (*Jour. of Obstet. and Gynec. of the Brit. Empire*, July, 1902) reports a few specimens which have been described which resemble this sort of tumor, in that they are ovarian carcinoma or malignant fibroadenoma whose epithelial elements are derived from germinal epithelium. The writer's case, at first sight, appeared to be a superficial fibroma. On section, however, small cyst-like spaces were seen within a white fibrous stroma. Microscopic examination showed the stroma to consist of firm fibrous tissue not very rich in cells, in which there were embedded numerous masses of epithelial cells varying greatly in size. Within some of these alveoli, and generally centrally placed, there were cavities varying in size, partly filled with fibrous masses, but also containing one or more vesicular egg-like cells. Round the margin of these little cavities, the epithelial cells were radially arranged, and approached in nature to cylindrical epithelium. As to the origin of these cells, two views appear to be tenable: They may be true egg cells—rests, as suggested by Schroeder; or else may be ordinary cells of the membrana granulosa which have enlarged and grown into semblance of egg cells under the same stimulus which has caused the pathologic overgrowth of the rudimentary follicles. It would appear from the fact that these tumors are usually found after menopause, that the structures derived from the germinal epithelium still retain the tendency and power to form rudimentary follicles and cells which, seen apart from their surroundings, would certainly pass for true ova.

**Cesarian Section—Fritsch's Fundal Incision.**—In connection with the operation of Caesarian section, there are at the present moment, three important questions sub judice. These are: (1) The conservative section versus Porro's, or intraperitoneal hysterectomy; (2) the sterilization of the patient if the conservative operation is chosen; and (3) the direction of the uterine incision. So says J. M. MUNRO KERR (*Jour. of Obstet. and Gynec. for the Brit. Empire*, July, 1902). In 1897 Fritsch first recommended the transverse fundal incision, because of the ease with which the child can be extracted from the gravid uterus. The advantages claimed by Fritsch and substantiated by the writer are: (a) The abdomen is opened into higher up, and so there is less risk of subsequent hernia; (b) by pulling the fundus well forward, the escape of blood and liquor amnii into the abdominal cavity can be better prevented; (c) the child can be more easily extracted; (d) the placenta is less frequently cut down upon; (e) there is less bleeding; (f) there is greater diminution of the wound, and less stitching is required. The objections urged against the operation are: (1) The incision makes adhesions to the bowel more liable, which may interfere with the involution of the uterus, and that discomfort from dragging on the abdominal wall will follow; (2) the uterus may become fixed to the abdominal wall three to five inches above the symphysis; (3) in case of any infection of the uterus general peritonitis is more liable to follow. This is not so great with the longitudinal incision, for it becomes shut off from the peritoneum by adhesion with the anterior abdominal wall. The danger of rupture of the uterus in a subsequent pregnancy is still a matter on which one

can not speak with any assurance, and certainly one can not yet compare the danger of rupture after a longitudinal with the danger after a transverse fundal incision.

**Birth of a Monster.**—The delivery of a well-developed eight-months fetus presenting two heads and three arms is reported by W. TIEBER in Bohemia (Prager med. Woch., July 10, 1902). This fetus was the result of a first pregnancy in a woman of thirty-six, and delivery was comparatively easy. There was no abnormal history. The fetus was a male, weighed 2010 grams (about 5½ lbs.), and was 39 c.m. long. The two normal heads were mounted on separate necks. The chest was broad, abdomen and pelvis narrow. A third extremity sprang from the junction of the two necks, containing a rudimentary scapula and humerus. Two distinct vertebral columns were present, separate in the thorax but united in the lumbar and sacral regions by the transverse processes. The thorax contained two hearts enclosed in a common pericardium, and four lungs each in a separate pleural sac. Two stomachs and duodena were also present and the latter united to form a common small intestine. A large divided liver presented two gall-bladders. There were two spleens and a double pancreas, but the remaining organs were of normal numbers.

**Thyroid Extract in Eclampsia.**—Many of the symptoms which patients develop under thyroid treatment are probably due to profound circulatory changes produced by the drug, says H. OLIPHANT NICHOLSON (Jour. Obstet. and Gynec. for the Brit. Empire, July, 1902). It is a well established fact that the thyroid gland is enlarged in normal pregnancy. In eclampsia, the normal enlargement of the gland is said to be absent. It is well known that under the action of iodothyryn the metabolic processes of the body are greatly stimulated and there is a striking increase of the secretion of urea. In eclampsia and in all conditions of hypothyroidism, the quantity of urea is greatly diminished. The symptoms of a typical attack of puerperal eclampsia closely resemble those of complete experimental athyroidism. When a pregnant woman, who exhibits eclamptic symptoms, is put to bed, and kept on milk diet, the demands made on her thyroid secretion are greatly lessened, and the process of nitrogenous metabolism is again efficiently carried out. The thyroid gland may under normal conditions participate in controlling renal function by: (1) The iodothyryn may exert some specific action upon the kidney; (2) urea—the final product of nitrogenous metabolism when efficiently carried out in the presence of an adequate supply of iodothyryn acts as a powerful diuretic; and (3) the well known changes produced upon the circulation (vasodilation) by iodothyryn, tend to promote and maintain renal activity. It is thus evident that the real significance of the pre-eclamptic is the break-down of the defensive mechanism, the result of some inadequacy of the thyroid and parathyroid glands, whereby the process of nitrogenous metabolism, instead of resulting in the formation of urea, ceases with the production of intermediate substances, which, when absorbed, excite the symptoms of toxemia. A large dose of morphia is a valuable adjunct in thyroid treatment, because it gives the thyroid gland time to recover itself by inhibiting metabolism and removing the arterial spasm.

**Retroflexion of Uterus.**—It is the firm conviction of E. WORMSER (Münch. med. Woch., July 1-8, 1902) that entirely too many women are being operated for malposition, especially retroflexion of the womb. The fact that all the symptoms often disappear as if by magic after the operation, though the patient was but little, or not at all helped by it, as far as the anatomical

condition is concerned, shows the true nervous character of the trouble. Uncomplicated, mobile retroflexions in otherwise healthy women, give no symptoms and do not require any treatment except sometimes during pregnancy. The symptoms which patients with mobile retroflexions complain of are due to complications which often cannot be readily detected; or they are the expression of a disturbance of the nervous system. In either case, the retroflexion as such is innocent. Only if active treatment of the complications, or of the nervous condition, is unavailing, should a correction of position be attempted.

**Sentence upon a Physician for Malpractice.**—The report of medico-legally important cases is always significant. Hence note is made by Dr. KEFERSTEIN, Imperial Court Physician at Magdeburg (C'blatt f. Gynäk., 1902, No. 23) of the sentence to five months' servitude pronounced upon a physician for applying an obturator to prevent conception in from 700 to 800 women, which in five caused bodily damage. It consisted of a disc with two arms attached which separated within the womb to retain the device *in situ*. Its use lowered the birth-rate to a very large degree, because although semen could pass upward through spaces permitting menstrual outflow, the presence of the arms within the cavity prevented arrest and development of the fertilized ovum. In one of the women an arm of this villainous foreign body broke off and in others various injuries to the womb occurred. Since the doctor represented to his patients that his obturator was "harmless" as well as "effectual" he was adjudged guilty of malpractice and accordingly punished.

**Resuscitation by Infusion through the Umbilical Vein.**—In 1882 J. Cohnheim made a comparison in his dissertation on general pathology between the plethora which is artificially produced by a transfusion of blood and that which follows physiologically immediately after birth by the emptying of the placenta into the umbilical vein by intra-uterine pressure, to which distinct attention was first called by A. SCHÜCKING (C'blatt f. Gynäk., 1902, No. 23). The latter author has been induced by a study of this phenomenon minutely by means of apparatus for the observation of changes in weight, blood-composition and blood-pressure in the newly-born to attempt an infusion of saline solution into the umbilical vein as a means of resuscitation when other more usual means threaten failure. His first result he reports in brief as follows: The child weighed 3,200 grams and was born in an exhausted condition after a very prolonged labor, which began with the child in the transverse position. All the known means of resuscitation were in vain and the heart sounds were scarcely distinguishable. He immediately cut the cord transversely, and having the necessary apparatus at hand began an infusion of saline solution into the umbilical vein. After perhaps 30.00 grams had been administered the child took a feeble respiration and the heart-impulse was more easily perceptible. Then 20.00 grams additional were given and the efforts of the baby were reinforced by Sylvester's artificial respiration. This method of treatment succeeded admirably and the child fully revived and lived. The apparatus he used was the Mariot bottle, tube and cannula. The solution contained 0.025-0.035 saccharate of sodium and 0.7 chloride of sodium. His theory as to the value of the former constituent is that the sugar takes up the carbonic-acid gas, making sugar and a carbonate of soda. The quantity of the saccharate of soda can be raised to 0.25-0.15 grams per cent. The admirable manner in which this procedure results in the asphyxia of the newly-born makes the author believe that it will be of service in all other forms of carbonic-acid gas poison-



ing, for example, strangulation, drowning, illuminating gas asphyxia, etc.

**Baths during the Puerperium.**—Baths are usually regarded in the present obstetrical teaching as contra-indicated during the puerperium, except for cases of septicemia in which cold hydrotherapy and cases of postpartum hemorrhage in which hot hydrotherapy fulfil respectively the usual indications for hyperthermia and shock. Excepting these unusual conditions most accoucheurs do not allow baths until after the puerperium is over and the woman again on her feet. G. MARTIN (*La sem. méd.*, 1902, No. 23), however, after a careful study of the subject, offers the following indications of the bath for the puerperal woman. By their sedative action, tepid baths at from 32 to 35° C. are of value to quiet the nervous system whenever it has been affected; for example, as is shown by cramps, urinary retention, mental excitement and the like. By their diaphoretic and diuretic influence they will be found to meet the usual calls of both these functions. Distended and painful breasts will go down at once or after a few hours through the action of warm baths lasting from twenty to twenty-five minutes. Errors in the involution of the uterus, lymphangitis of the breasts, galactophoritis and other inflammatory conditions are all benefited. There are, of course, absolute contraindications of body-baths during the puerperium which are summed up in the dangers of infection from any possible source; of such lesions of the external genitals, ulcers of the leg, abscesses, ulcerating gumma and the like are familiar and emphatic examples.

**Abdominal Hysterocolpectomy.**—A new operation for removal of cancer of the cervix uteri is proposed by J. H. GLEASON (*Phil. Med. Jour.*, June 21, 1902). The requirements for favorable results must be an early diagnosis while the disease remains localized and removal of the organs and tissues wide of the infected area. The operation is done in two sittings, the preliminary one consisting of the removal by curette of the growth from the cervix and after dilatation of the latter, the removal also of the endometrium. The diseased vaginal areas are then excised and the cut edges united with silkwormgut sutures. The patient is then given three bichloride douches daily and the main operation may be done twelve days later with little danger of septic infection or the implantation of "cancer" cells. At this time the vagina is again carefully cleansed and the surfaces swabbed with pure carbolic acid followed by alcohol. A circular incision is then made at least 1½ inches below the limit of the disease and a cuff of vaginal tissue dissected back. The abdomen is opened by a median incision and after ligation of the proper vessels an extensive dissection is made including the uterus, adnexa, pelvic glands, pelvic cellular tissue and the vault of the vagina. A gauze drain is passed out through the vagina and the bed of the genital tract obliterated by a series of buried purse-string sutures which pass from the remains of the vagina below to the peritoneum above. The pelvic cavity is then closed by uniting the peritoneal reflections from the bladder and rectum and the abdominal incision is sutured. An extensive removal of tissue is thus provided for and by the obliteration of the tract of the enucleation, the maintenance of a large granulating surface is avoided.

#### MEDICINE.

**Abscess-Perforation of the Esophagus.**—Perforation of the esophagus from traumatism, or from ulceration of malignant growth, is of extreme rarity; rupture by violent vomiting is more common. The following case was proved by autopsy to have been due to an abscess of the posterior mediastinum which ul-

cerated through the wall of the gullet. The girl was under the care of Mr. N. Tirard, was nineteen years old, admitted Nov. 12, 1901, for chronic cough and fetid purulent expectoration. One sister died of tuberculosis. The patient had had repeated attacks of quinsy for which her tonsils had been removed, and had rheumatism once in childhood. The present sickness began about Oct. 1 with headache and nausea but no vomiting. Cough, fetid expectoration, and vomiting began a few days later accompanied by a "nasty taste in the mouth." After about three weeks the fetid expectoration became a feature and she was treated for abscess of the lung. Physical examination showed hardly any signs whatever. A few râles were present in the right chest in front. The general condition of the patient continued to grow worse slowly. Repeated examinations failed to find any definite signs and several exploratory aspirations did not reach any localized empyema or abscess either in front or behind. With the hope of finding one, an exploratory thoracotomy was done which likewise failed to reach any suppurating focus. Death supervened a few days later after a slow sinking of the patient's strength. At the autopsy the following condition was discovered: In the anterior wall of the esophagus, just at the bifurcation of the trachea, was an opening the size of a number 8 catheter, which entered an abscess cavity the size of a hen's egg which was filled with a mass of necrotic tissue, cone-shaped, composed in part of old fibrin and gangrenous material; its fluid contents was foul pus and the walls also gangrenous. The right bronchus had a communication with this abscess about one inch distal to the bifurcation of the trachea, whose gangrenous edges tore on examination and thus prevented determination of the size. This bronchus was inflamed throughout and the right lung in a state of recent insufflation pneumonia and in spots ready to break down and suppurate. The left bronchus was also inflamed but the left lung had no signs of pneumonia. The pleura over the base of the lung was adherent but nowhere else at all affected. Here, therefore, was a patient with a fatal condition which gave no physical signs of its presence until at a very late period. As such the case is worthy of note (*Lancet*, July 12, 1902).

**Spotted Fever.**—This disease has been recognized in certain mountainous districts of Montana and Idaho for twenty years, and though its history and clinical symptoms have been described, the first report on its pathology and etiology has lately been made by WILSON and CROWNING (*Journ. Am. Med. Assoc.*, July 19, 1902). The disease is characterized by an acute onset with chills and fever, an eruption extending over the entire body, beginning as a macular rash which later becomes of a spotted or marbled character and subsides in several weeks, followed by a general desquamation. There is a moderate anemia, tender and enlarged spleen. Constipation is usually present. The urine is reduced in amount and contains a small percentage of albumin. As complications, gangrene, hypostatic pneumonia and articular rheumatism often occur. The prognosis is bad, especially if the eruption is marked. A series of six autopsies were made. The only gross lesions found were a much enlarged spleen with distended and thinned capsule, subcapsular hemorrhages in the kidneys, slightly enlarged and pale liver, and some congestion of the meninges and viscera. Sections show a capillary congestion throughout, with many of the red cells containing parasites. There were found fatty degeneration of the liver and acute parenchymatous nephritis. Blood preparations during life showed a marked poikilocytosis and anemia.

In studying the etiology of the disease the following

facts have appeared to be of most significance: (1) the definitely limited locality in which the disease occurred; (2) the season (March to July); (3) the symptoms and lesions indicating a specific infection; (4) no evidence of transmission directly from one patient to another; (5) no signs pointing to the digestive, respiratory, or genito-urinary tracts as avenues of infection; (6) in all cases examined, small wounds of the skin were noticed, said to have been made by the bites of ticks. Bacteriological examinations showed no bacteria of any etiologic significance. Examination of the blood, both before and after death, showed the presence of an ameba-like organism in the red cells which varied greatly in form, size and staining reaction at various stages of its development. In marked contrast to the small number of infected cells in the circulating blood, is the great number of infected cells in the congested capillaries in the tissues removed at autopsy, where from 1 to 5 per cent. of the red-cells contained each a large parasite. This is especially marked in the lung, spleen, liver and kidney. The organism resembles in its smaller form that of Texas fever, yet differs in being as a rule larger, and exhibiting active ameboid movements. The absence of pigment would apparently separate it from the malarial group and place it with that of Texas fever. Inoculation experiments made with rabbits showed the presence of the organism in the blood within twenty-four hours, and on successive days for two weeks. The authors, from their observations, advance the hypothesis that the disease is conveyed to man by the tick. The facts which support this view are, (1) that the disease has been known to prevail only during the period of the active life of this insect; (2) the occurrence of spotted fever in isolated cases in sharply limited regions would indicate that the carrier traveled slowly and not widely; (3) all hematozoa of warm-blooded animals pass at least one phase of their development within the body of some host, usually an insect or arachnid; (4) the organism of Texas fever in cattle is conveyed through the bite of ticks, and the germ of spotted fever seems closely related; (5) all the patients observed were known to have been bitten by ticks. The authors believe that the intermediate host is probably one of the lower mammals, such as the gopher.

**On the Relation between Pupillary Affections, Syphilis, Tabes and General Paralysis.**—Of 1100 cases studied by HENRI DUFOUR (*Le Progrès Médical*, June 21, 1902), eighty men and nineteen women were avowedly syphilitic. Inequality of the pupil was observed in many cases which were free from syphilis or nervous disease. Irregularity of the pupil points strongly to syphilis or one of the so-called parasymphilitic infections. The Argyll-Robertson pupil is found in syphilis, tabetics, and those with general paralysis. Of the eighty syphilitic men, about 25 per cent. had either a nervous or a pupillary affection. These observations confirm those of Babinski on the relation of the Argyll-Robertson pupil to syphilis, and those of Joffroy and Schrameck on pupil deformities in tabes, general paralysis and syphilis. Vidal believes that the Argyll-Robertson pupil always indicates a syphilitic nervous lesion.

**Treatment of Gastric Ulcer.**—In a series of interesting articles, the well-known stomach specialist, W. FLEINER (*Münch. med. Woch.*, July 3, 10 and 17, 1902) gives his views on the proper treatment of gastric ulcer. The first and foremost principle is absolute rest in bed which should be kept up at least four weeks. If the patients are still in a fairly good condition, their stomach is kept empty since the contraction thereby induced renders the ulcer smaller and more capable of spontaneous healing. It is necessary, however, to add some fluid to the system and for this purpose eight to ten

ounces of lukewarm water, or in run-down subjects nutritive enemata, with or without stimulants, are administered per rectum. There can be no objection, however, to the swallowing of small pieces of ice or of cold water, as the contraction of the stomach may be increased. An ice-bag may be placed over the epigastrium when the slightest distention is noticed. The longer this treatment can be carried out, the better, but a strict milk diet, increased up to 250 c.c. every two to two and a half hours should be started, if possible before the general condition suffers. After two to three weeks the nutritive value of each ration may be increased by boiling the milk with cereals, such as arrow-root, rice or maizena, or by adding cream. A number of cases will be encountered in practice where milk does not well agree and here barley gruel, cereal soups or meat jellies may take its place. Finely cut chicken is added to the diet after the fourth week, and if this is well taken, other white meat, mashed potatoes, boiled rice and eggs are permitted. Not until the elapse of the sixth week may the patients partake of red meats, young vegetables and boiled fruit. It is even now desirable that a certain amount of rest be taken directly after the meals. Vichy forms an excellent drink during this period. Before discharge the patients must be carefully instructed to avoid all irritating food including meat-extracts, preparations containing albumose and peptone, and all alcoholics and to carefully masticate their food. While long journeys after a cure of this kind are not indicated, convalescence will be more rapidly established by a stay in a suitable country place. The greatest advance in the therapy of ulcer is undoubtedly the use of gastric lavage to remove all stagnating and irritating food. This is contra-indicated only where there is a tendency to hemorrhage or where a profuse bleeding has occurred within two or three months; and it is supplemented by pouring ten to twenty grams of bismuth subnitrate suspended in 100 to 200 c.c. of warm water into the stomach. The bismuth will at once coat the ulcerated area, will soothe the pain and favor healing by its antiseptic and protective action. After the lavage, which is best performed early in the morning, the patient must remain for one-half an hour in that position which best favors precipitation on the raw surface, and then breakfast is given. Where lavage is not necessary, the patient may drink the bismuth suspension. There are three objections to bismuth, viz., constipation, the formation of concretions and intoxication. The first can easily be combated by enemata, the other occur too rarely to be considered. The use of the subcarbonate of bismuth or bismutose offers no advantages. Not less important than the treatment of ulcer is that of its complications and it is here that surgical interference is most often required. Where there is an hour-glass stomach or stenosed pylorus, only an operation will relieve, and the same may be said where the ulcer is situated at or near the pylorus and when the frequent pyloric spasms directly oppose all natural healing. As is often the case here, the patients vomit large amounts of fluid, and when tetany sets in, no more time should be wasted in placing the patient on the table though the dangerous inspissation of the blood may be overcome by intravenous infusion of saline solution. Turning now to the subject of hemorrhage, a profuse bleeding demands rest, abstinence from all food, ice-bag on abdomen and small pieces of ice to suck, ergotine hypodermatically, ligation of the extremities and perhaps camphor. After one to two hours, the ligatures are slowly removed and the circulation is improved by means of clysmata of 200 to 300 c.c. lukewarm saline solution, or beef-broth, to which ten to twenty grams of white gelatine may be added with



advantage. Of course, the ideal procedure would be laparotomy with ligation of the bleeding vessel but gastric surgery has not yet advanced far enough to allow this to be done with safety in all cases. Perforation, however, belongs more strictly to the surgeon's domain, though the author has seen cases recover under medical care. The operations performed on the stomach for ulcer are three-fold, viz., resection and excision of the ulcer, pyloroplasty and gastro-enterostomy. To judge from the experience of Czerny's clinic, the last-mentioned is the least dangerous and most often successful of the three, especially since the Murphy button has been used more freely. It seems that by this operation, a state of contraction is induced in the stomach, and the free passage of food into the intestines prevents a recurrence of the trouble.

**The Urine in Stenham's Chorea.**—The urine of choreic patients, according to DE MARCHIS (La Riforma Medica, July 6, 1902), presents the following characteristics: Diminution of the daily quantity; specific gravity relatively high; total acidity increased; diminution during the disease of the quantity of nitrogen which is not eliminated as urea; increased elimination of uric acid; decrease in elimination of chlorides; increase of phosphates; total quantity of sulphuric acid and allied substances, unchanged.

**Diphtheria Complicating Scarlet Fever.**—Arising during the course of scarlet fever, diphtheria is seen not only during the convalescence from the former disease, but also at its height and its very beginning. According to J. A. SCHABAD (Archiv f. Kinderheil., July, 1902), in the early stages of scarlet fever the diagnosis of diphtheria depends on the agreement of the clinical symptoms with the results of the bacteriological examination. While the diphtheria bacilli found in the throats of patients during the convalescence from and during the height of scarlatina, possess the normal virulence when injected into guinea-pigs, on the other hand cultures of the Klebs-Löffler bacilli taken from the throats of incipient cases of scarlet fever, although morphologically characteristic, have little or no virulence with respect to guinea-pigs. This absence of virulence, however, does not exclude the diphtheria bacillus from taking its share in the production of the pathological processes seen in the combination of these two diseases. At times diphtheria bacilli are found in the throats of incipient cases of scarlatina, when no clinical symptoms of diphtheria are present. In view of the milder course and more favorable outcome of these cases, it appears that in them the diphtheria bacilli play the rôle of saprophytes, taking no part in the production of the pathological process. In hospitals for contagious diseases all cases of scarlet fever in whose throats the diphtheria bacilli are found, should be isolated from the rest. It should be understood that cultures should be taken in all cases of scarlatina on admission to the wards.

**Widal's Reaction in Weil's Disease.**—Two very clear cases of Weil's disease came under the care of T. ECKARDT (Münch. med. Woch., July 6, 1902), who, strangely enough, found that in both the Widal reaction was positive even in as strong a dilution as 1:1000. Commenting upon this, he points out how often the reaction is positive in jaundice from any cause; it does not seem to be the bile alone but some combination of the bile with the blood which is able to produce agglutination. Yet this does not explain these two cases, for the reaction was much too strong to be referred to the icterus alone and was still present when this had already disappeared in almost the same strength. Though the presence of jaundice and nephritis, such as occurs invariably in Weil's disease,

strongly militates against the diagnosis typhoid, yet the author is inclined to regard the disease merely as a peculiar, abortive type. There are a number of other reasons which also speak for this, such as the synchronous occurrence of epidemics, and the frequent presence of a characteristic temperature curve, epistaxis, general malaise, recurrence and sometimes roseola.

**Malaria and Appendicitis.**—The addition of a sharp attack of malaria to some slight abdominal condition is apt to arouse considerable anxiety in regard to the possibility of abscess condition and has sometimes led surgeons to operate unnecessarily. H. J. WOLF (Med. Rec., July 12, 1902), besides mentioning those attacks of malaria with abdominal symptoms which closely simulate an acute appendicular condition but which can usually be diagnosed by the further course of the disease and by the blood examination, also reports cases in which the two conditions occurred simultaneously. A mild attack of appendicitis may be accompanied by a malarial chill and the true status becomes difficult to appreciate. In one case the malarial condition was diagnosed by the blood examination, but the mild symptoms of appendicitis persisted till that organ was later removed and found to be the seat of considerable inflammation. Most careful examinations are necessary in these cases, for it must not be forgotten that the discovery of plasmodia in the blood does not exclude the possibility of a co-existing appendicitis.

**Hodgkin's Disease and Lymphatic Leucemia.**—The pathology of these diseases is still very obscure and so far as etiology is concerned very few important points have been added to the description as given by Hodgkin himself. M. EINHORN (Med. Rec., July 12, 1902) reports several cases and lays stress upon the resemblance which these diseases bear to one another. So far as symptoms are concerned the differential diagnosis cannot be made for glandular swellings characterize both and the anemia may be equally marked. The only important difference lies in the blood constituents and upon this the diagnosis rests. In lymphatic leucemia there is a marked increase in the lymphocytes, while in Hodgkin's disease their relative and absolute number remains about normal.

**Dietetic Treatment of Biliary Fistula.**—Operations upon the bile ducts and bladder have the great danger of secondary chronic biliary fistula which may waste the patient's strength by loss in assimilating power and, therefore, require a second intervention for their cure. JABOULAY of Lyons (La Sem. Méd., 1902, No. 27) reports a most instructive case in which purely dietetic measures sufficed to give nature the chance of healing the sinus by checking the flow of bile outward. The woman had suffered for some time from this flow of bile which had the strange characteristic of appearing only at night, while in the day during presumably digestive activity the secretion was determined in its flow toward the intestine, so that during her hours of work only mucus escaped. The patient's last meal of the day was at half after four in the afternoon, so that at ten o'clock at night when she retired digestion of the food was over and the bile began to flow outward again. Jaboulay determined to try the effect of a late meal and gave her one at bed-time. He was surprised to find that its stimulation of digestion stopped the leakage of the bile till about four o'clock each morning. Its quantity was so scanty that healing occurred. Had the reverse obtained, he would have given an early morning meal, too. From this observation Jaboulay states that these patients should receive food every four or five hours in order to keep the bile from tendency to collect in the bladder and then leak. L. Tixier and

V. Chappet both of Lyons offer contributive and corroborative evidence in reporting to Jaboulay another case treated in the same way successfully.

**A New Method of Vaccination.**—At the present time vaccination, upon the adult especially, does not present a very high percentage of successes. The failures are very numerous in the experience of every practitioner, and it is usual to ascribe them to natural individual resistance, to the immunity present from a preceding vaccination no matter how remote, to atenuity of the virus from age, to ineffectivity of a particular point or tube because it did not carry sufficient virus. Failures in vaccinating children were excused by the above reasoning, and in addition a purely hypothetical cause was adduced by which immunity was conferred by the parent upon the offspring. Unfortunately, for the truth of such a contention, cases have become known in which the inoculation succeeded in mother and father, or in either, although it failed in the child. The virus was in most of such experiences blamed but it, too, was not at fault because it acted well in other families. The method of operating was next charged with the cause and scarification and scratching, alone or combined, with the needle or the scalpel were adopted by various operators. The difficulties in actual practice which these failures to inoculate may cause, are illustrated by the observations of M. BOIGEY (La Sem. Méd., 1902, No. 27) during the recent epidemic in Lyons. Patients sickened more or less severely, some fatally of smallpox who had been pronounced immune because vaccination practised upon them shortly before the attack had utterly failed. Instances of this same thing have been reported from London during the recent outbreak in that city. Boigey seeks to explain the failures of vaccination in the rational manner of assuming that when the virus does not enter the lymphatic channels failure results. He concluded from this premise that if a means can be devised for insuring the entrance of the virus into the lymph spaces the vaccination will almost always succeed. The indications are plainly that the breaks in the epidermis should be multiple and very close together. The old-fashioned scarifier was, therefore, made on the correct principle but did not after all do the work successfully every time. Boigey has attempted hypodermatic injection of the virus only once, abandoned it solely because too dangerous, through liability to abscess-formation, to systemic poisoning, to contamination of the virus by unnecessary handling, and through other obvious technical difficulties. He thought of using the vesicle of a burn as the avenue for securing entrance of the virus. He consequently devised a vaccinating hammer ("*marteau à vacciner*"), or as it might be called a vaccinating cautery. Its face is very gently convex and its handle is 18 cm. long. The essence of the process is that the hammer shall be heated in boiling water and then lightly applied to the site of vaccination. The burn is of the second degree and in a very few minutes a blister forms over it. This is punctured and the virus is put beneath the epidermis into the serum, which is an excellent culture medium for the vaccine virus. He has had only entirely satisfactory results from this procedure. In public practice several hammers are at hand, applied in turn to the arms, and the patients withdraw till the blister appears when in turn the virus is added. It takes no more time, causes no more pain and is more certain than the present methods.

#### SURGERY.

**A New Protective Dressing.**—The original protective silk devised and recommended by Lister has the disadvantages that the carbolic acid contained in it as

a means of sterilization may irritate the wound and skin and the nature of the fabric is such that matting and adhesion to the suture-line are not always avoidable. For these reasons this silk is now very rarely used. It has been followed by the various types of silk-taffeta, rubber-tissue, silk and cotton soaked in vaseline and fats, with the object of preventing adhesion to the wound, flaps or suture-ends and hence of avoiding tearing when the dressings are changed. All these have their individual merits and in common the great demerit that their form, composition and consistence do not permit sterilization by boiling more than once at the most, and hence necessitate emersion in various antiseptic fluids which may thus be transferred to and injure the field of operation. Their features do not moreover permit full adaptation and uniform apposition to the wound and hence often render protection imperfect. CARL SPRINGER (C. blatt f. Chir., 1902, No. 24) seeks to meet all the indications of protective dressing by making a perforated, soft pellicle of paraffin. His ingenious and simple article is made in the following manner: Paraffin of a melting-point of 45-47° C. is selected and 1 to 2 cubic cm. taken for every 50 square cmm. of the water-bath into which in a shallow dish it is thrown, boiled until melted and then continuously boiled for ten minutes for sterilization. The water-bath is then put into another flat pan of cold water to cool while the paraffin forms a thin film upon its surface and remains soft and plastic when the body-heat is reached, yet tenacious enough to permit of handling, cutting, perforating with a hot needle, molding and adapting to the body-surface. When so treated it remains soft, does not irritate the skin or wound or adhere to them or the other dressing; it is chemically inert, can be made-over by the same process ad lib., is very cheap and durable, fulfils all the indications but possesses none of the disadvantages of its predecessors in the domain of protective dressings. Finally, its translucency permits phototherapy to be used at the late stages of wound treatment when ordinary dressings prevent it. The quantity of paraffin used by Springer makes a film of suitable thickness for these purposes. The one caution of the process is not to shake the pans during the cooling-process, so that the layer will be of uniform thickness.

**Appendicitis.**—This disease is of such frequent occurrence and of such vital significance that too many discussions of it can not be held nor too numerous opinions offered in order to make up the consensus of ripe medical and surgical judgment as to its protean features. Sir FREDERICK TREVES (Lancet, June 28, 1902) delivered the Cavendish Lecture recently and made inflammation of the vermiform appendix his subject. The most practically important and the least easily decided point is that of the most fitting time for operation. Upon this question he offered the following data, summing it up with the interrogatory: "What is the probability of relapse?" In the earlier days of the disease relapses were according to available statistics comparatively rare, namely 20 to 30 per cent., but at the present time relapses are so very frequent that the rule may be laid down that the vast majority of cases are subject to them. Therefore, it is allowable and advisable to-day to inform any patient that the figures are against him and that after a first frank attack an operation has but trifling dangers, and should be undertaken. He, however, formulates this remarkable dictum with which very few American surgeons will agree either as to the pathological fact stated or as to the therapeutical wisdom of the treatment outlined or as to the prognosis claimed: "If there has been an abscess in the first attack, then I think an operation may be



put out of court altogether, because that abscess will in certainly 95 per cent. of the cases obliterate the organ and render it harmless." He makes no mention of the features of the other 5 per cent., granting the correctness of his figures. Concerning the rare cases which under modern means of diagnosis do not relapse, he offers the following conclusions: As a rule the original attack is in the presence of incidental or habitual errors of diet. Of the incidental errors no better example can be cited than that of children who after having overloaded the gastro-intestinal system with indigestibles suffer from a more or less impacted cecum and a secondary appendicitis. Appropriate relief at the moment and prophylaxis in the future of the cause, commonly avoids all later onsets. The best example of appendicitis through habitual abuse of dietetic hygiene is presented by the overworked physician or the unduly zealous traveling salesman, who may permit themselves to take food at any and all times and under unusual conditions of haste, worry and fatigue and too frequently of improperly prepared or selected matter. If the vicious habits of such patients can be overcome, as a rule no relapses will occur.

**A New Hemorrhoid Operation.**—Probably on account of the variations in the pathogenesis of hemorrhoids, their treatment especially by operation is very diverse and every few months some surgeon proposes another more or less unique method of interfering with these annoying tumors. J. POTARCA of Craiova (Rev. de Chir., 1902, No. 5) describes a method of his own, of which the following are the essentials: The only special instrument is a cork plug 8 to 9 cm. long, 3 to 3.5 cm. in diameter, pierced by a heavy-wire loop as a handle. The margins of this plug are rounded off and its surface bulges a little at the center. Under the usual aseptic and antiseptic precautions the plug is inserted into the rectum under deep anesthesia and after the anus has been dilated with the bivalve. After the latter has been removed the bowel will shut down upon the cork and after a little manipulation the pile-bearing zone can be fully and evenly everted upon the cork. Then with pins driven 1 cm. apart through the tissue and just distal to the muco-cutaneous juncture the part to be removed is secured against slipping. A sharp knife now encircles the row of pins in such a manner as to cut them and the pile-bearing zone free. The cork plug is now withdrawn a little more, and after hemostasis, the cut edge of the mucosa and the muco-cutaneous line are sutured. Cosmetically and functionally the results are very acceptable. The operation can be carried out very quickly.

**Anæsthesin in the Treatment of Wounds.**—The recent discoveries of v. Noorden as to the effect of anæsthesin after internal administration, led Dr. LENGEMANN (C'blatt f. Chir., 1902, No. 22) to investigate its local action. He first had the substance experimented with pharmacologically by Biberfeld and established the facts that it causes good local anesthesia without any irritation, and then in the clinic of von Mikulicz proceeded to apply it to wounds. His reports concern solely granulation surfaces of two classes, those which were painful because touching with nitrate of silver was necessary and those which in their nature were painful, like extensive burns, independently of treatment. He found that if the powder be sprinkled upon wounds of the former class and allowed to remain for some time practically all the terrors of the silver-nitrate stick were overcome. In only one patient did this result fail, almost undoubtedly because the interval between the dusting of the anæsthesin and the use of the caustic was too brief. The pain of extensive burns was not always overcome totally but invariably partially, so that

the usual dressing of 1 per cent. nitrate of silver solution could be applied with little inconvenience to the patient. The other advantageous features reported are absence of any ill effect upon the progress of the granulations, of any irritation of the surrounding normal skin and of any signs of absorption and poisoning. Its non-toxic local effects are in accord with the harmlessness of the substance in suitable dose as emphasized by v. Noorden.

**The Pathogenesis of Secondary Hemorrhage.**—The severe and often very dangerous bleedings which formerly appeared late in a wound, sometimes even after three weeks, and, therefore, kept nearly every surgeon in an attitude of uncomfortable anxiety, are happily to-day among the greatest of rarities and surgical curiosities. It is a singular fact, however, that literature is comparatively barren of records of researches in this field, especially upon fresh specimens. A. FROMMER of Krakau (Archiv f. Klin. Chir., B. 67, H. 3) has consequently availed himself of specimens obtained at the time of the second operation undertaken to finally check the secondary hemorrhage in six cases of inflammatory processes. His microscopical findings are briefly the following: The connective-tissue zones in one class of specimen are thickly infiltrated with small round cells, which may be easily differentiated not only in the adventia but also in the media and intima coatings. These features are higher in degree, more extensive in penetration and destructive of the normal arrangement of the tissue, the nearer to the inflammatory process the vessel lies. In marked examples normally disposed connective-tissue fibers and smooth muscle-elements are forced asunder by this infiltration, and at some points the changes closely approach disintegration and necrosis. Occasionally blood will coagulate and begin to organize over such an area. The degree of weakening to which this process may subject the wall is illustrated by the formation of a true aneurism as a late sequela of suppuration in one of his cases, which later burst. The next step in these processes is that of localized erosion, which may be of almost any relative size and form. In such under the microscope there are found advancing death of tissue commonly extending inward and sometimes by a clot. The sum-total of these findings differs from those shown in the admirable monographs of Marchand and of Weber in depicting a mere type of process, probably because Frommer's specimens are obtained from the field of operation at the time of the treatment, while those of these authors are dissecting-room revelations. The practical therapeutic application of this pathogenesis is that in operating, it is probably wiser not to make incisions any longer than absolutely necessary in order to avoid damage to the vessels, in the first place; and in the second place, it is advisable to remember possible connections with large vessels had by extensive and deeply-seated abscesses, and therefore to have attendants warned of the possibility of secondary hemorrhage and commanded to have every possible means of checking it at hand. In this connection he has found gauze packing unreliable, in that, after temporary cessation, the flow usually is renewed with great activity. Therefore ligature of a large artery proximally and sometimes distally to such a bleeding zone is the only rational treatment. The caution of such secondary operation is always to tie in sound vessel-wall.

**Crushing Injuries of Joints.**—In the treatment of compound injuries of the large joints with extensive injuries to bones and soft parts, drainage of the joint cavity at the primary dressing is generally advised. J. G. SHELTON (Phil. Med. Journ. July 12, 1902) believes that primary drainage is not only unnecessary but

even harmful. He proceeds as follows: After cleaning the injured parts as thoroughly as possible, the detached fragments of bone are either removed or placed in their proper positions. The joint cavity is completely closed by the suturing of ligaments or muscles. The defect in the skin is not closed. The author reasons that the skin and subcutaneous structures are subject to more trauma than the deeper ones and more unclean material is ground into them. This makes disinfection more difficult and also reduces their vitality. The deeper structures can be more readily rendered sterile. The advantages claimed are: The clean joint cavity is protected from the unclean superficial structures, which are thoroughly drained, and the possibility of secondary infection of the joint cavity is diminished. If secondary drainage becomes necessary, because the deeper structures have not been rendered aseptic, it can be easily done. Attention is, however, called to the fact that a considerable quantity of fluid may be present in an injured joint, and still the latter may be clean and remain so.

**Sub-phrenic Abscess.**—A retro-peritoneal abscess on the left side is usually due to disease of the kidney or trauma, but one following appendicitis, it is claimed by E. A. DARLING (Bost. Med. and Surg. Journ., July 17, 1902), has never been reported. His case is interesting because of the obscurity of the diagnosis while the abscess was developing and because of the rarity of suppuration in this region as a sequel to appendicitis. The patient in question developed an attack of appendicitis for which operation was done, resulting in the removal of a gangrenous and perforated appendix without evident signs of pus. About two months later signs of a localized abscess developed on the left side but its location either above or below the diaphragm was doubtful. An incision as for nephrotomy was made and the abscess located behind the peritoneum, bounded by diaphragm, spleen and kidney. None of these organs, or any of the neighboring bony processes, were involved. The infection apparently crossed the median line, but whether by vascular or lymph-channels is speculative. A tuberculous origin could be excluded.

**Eventration of the Diaphragm.**—Besides the genuine and false hernias of the diaphragm there is also a rare affection known as eventration where there is no hernial sac and no separation of the fibers of the diaphragm, but instead, a general thinning out of the entire half of the muscle. A case of this kind is described by H. DÖRRING (Deutsch. Arch. f. klin. Med. Vol. 72, Nos. 5 and 6). The dilation reached up to the spine of the scapula so that instead of normal pulmonary resonance there was tympany due to the intestines over the lower part of the left chest. A microscopical examination showed that all the layers of the diaphragm were preserved, but very thin. Clinically it is of slight importance to distinguish between this and hernias, but a higher degree of displacement on the part of the heart and left lung, together with an unchanged form of the thorax, generally speak for the eventration. In the case cited there were few symptoms until shortly before death, when the hypertrophied right ventricle began to fail. It is probable the condition began in early youth and had its origin in the absence of respiratory movements on the left side whereby the corresponding lung remained small and the increasing negative pressure in the thorax forced the abdominal contents upward.

**Foreign Bodies in the Lungs.**—The entrance, retention and presence of foreign bodies anywhere in the anatomy are followed by certain symptoms and then by more or less well-determined pathological processes. If the viscus into which the foreign body has penetrated be one of activity like the lungs, this symptomatology

is sure to be much more pronounced. T. A. KORTWEG, of Leyden, (Annals of Surgery, July, 1902) concludes as to foreign bodies in the lungs as follows: Those bodies which enter through the larynx, if they do not at once cause suffocation, may sometimes be borne easily enough for a short or a considerably long time. If smooth and round, or of regular outline, they are commonly coughed out or maybe removed by a tracheotomy. If the bodies are of rugged outline, even when retained for some time and until suppurating processes have occurred, after removal by tracheotomy the prognosis becomes as a rule good. If, however, the body, no matter what its kind may be remains in the lungs indefinitely, the final result is necessarily the death of the patient. The same results ensue if the foreign body has been introduced into the viscus by force from without, such as in the case of gunshot wounds. The pathological process incident upon all these cases is briefly this: Around the foreign body follows decubitus and behind it necessarily retention of mucus. The ensuing inflammation and swelling only make this situation worse. In some cases the symptoms of ulceration prevail while in others those of retained pus and abscess-formation are predominant. The mucus retained by the blocking of the bronchi by the body, and the damage by the body to the delicate lung-structure render the dangers of infection more and more definite. The bronchus closed by the body distends partly by the force of the actual damming back of the mucus, partly by the efforts at coughing always chronic and violent, and partly by the negative pressure of the surrounding active lung. The condition within the lung is now such as to provide lobar pneumonia. As soon as this viscus circle of retention, infection, dilatation, and inflammation occurs it is hopeless to try to stop the process. In this stage will be seen the expectoration, fever, physical signs and symptoms of a gangrene of the lungs which sooner or later has a fatal termination.

**Intestinal Obstruction.**—In a case of intestinal obstruction the continued use of cathartics is, of course, one of the most harmful procedures that can be undertaken, and yet the general practitioner is frequently guilty of this mistake, usually because he does not fully appreciate the nature of the trouble. E. A. BALLOCH (Washington Med. Annals, July, 1902) urges that the surgeon should be called in earlier because it is really a surgical condition, and if operation is to be successful it should be done before the characteristic stercoraceous vomiting begins. High rectal injections are, perhaps, the best means of averting an operation and these should be thoroughly and persistently used, perhaps, for several hours. Lavage is also beneficial in removing any irritating substances from the stomach and in allaying vomiting. The persistent use of cathartics has the unpardonable effect of causing such an irritability of the stomach and reversed peristalsis of the intestines that even after an operation has been performed and the obstruction removed, the patient may continue to vomit in spite of all measures undertaken.

While we may not see in any one case all the cardinal symptoms of obstruction, viz., pain, constipation, vomiting, tympanites and tumor, yet the diagnosis should be made in most cases without much difficulty. The occurrence of vomiting, in connection with absolute constipation, renders the diagnosis practically certain, and if to these are added distension and a weakening pulse obstruction may be diagnosed positively. The temperature is usually subnormal, differentiating it from inflammatory conditions. The function of the physician is to make an early diagnosis and if high injections prove unavailing to seek the aid of a surgeon before it is too late.



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## RHEUMATISM AND DAMPNESS AND PROPHE- LAXIS.

It is the custom to think that acute articular rheumatism is associated practically always with dampness. As a consequence the disease is assumed to be most frequent towards the end of winter and in the beginning of spring, and to be quite rare towards the end of spring when the weather has settled down into the warmer, drier temperature that resembles early summer. As a matter of fact, hospital statistics seem to show that rheumatism is more frequent during May than during any other month of the year.

At Charing Cross Hospital in London, as pointed out by Bosanquet in the *London Lancet*, June 2, 1900, two months in the year show a maximum frequency of rheumatism in a series of years. These are May and November with a distinct tendency for the usually warm spring month to surpass the blustery November in fostering the disease. There is not, however, a very marked difference in the incidence of acute articular rheumatism at one period of the year as compared with another.

This is what is to be expected if the present prevailing theory as to the etiology of rheumatism be correct. The disease has been transferred

by all the clinicians from the category of affections of metabolism to that of infectious diseases. The microbic cause of the disease is probably always present in the atmosphere. The predisposition to be affected by the microbe may be acquired more easily at one season of the year than at another, but opportunities for infection are not lacking at any season of the year. There is a tradition that damp localities are much more favorable to the development of the disease than others, yet it has never been shown that the people living along the sea-coast of a country are more subject to acute articular rheumatism than are others. This fact has become so notorious, though the theory of dampness being associated with rheumatism still prevails popularly, that it has been deemed necessary to invent an explanation for it. Accordingly there is a widespread tradition that salt-water dampness is unlike fresh-water dampness as regards the absence of the tendency to produce rheumatism.

Rheumatism is known to occur in high, dry mountainous regions and in warm, dry seasons. The Bedouins of the desert suffer very severely and even frequently from the disease. Dr. Wm. H. Thomson pointed out at a spring meeting of the Section on Medicine of the New York Academy of Medicine (see *MEDICAL NEWS*, April 12, 1902, p. 715) that hot, dry countries are not free from the disturbance of cutaneous transudation that seems to predispose to acute rheumatism. When the Arabs lie down in their tents at night the warmth of the sun is still in the air and they perspire very freely. Before morning, however, the marked fall of temperature that occurs during the night leads to an abundant deposition of water from the air. This heavy dew, so characteristic of very dry regions, seems to have a direct effect in predisposing patients to the acquisition of rheumatic fever.

Some such factor would seem to be at work even in temperate climates like our own, for it is well known that the first few very warm nights of spring are apt to be followed by a series of cases of genuine rheumatism, quite apart from the painful conditions that may follow chilling. More important than any extraneous factor, however, would seem to be the internal predisposition of the patient. Those who have once suffered from rheumatism are known to be predisposed to its recurrence. Those who acquire the disease for the first time will usually be found to have been in a condition of deteriorated health when affected. Undoubtedly, however, there

seems to exist a rheumatic diathesis in the sense that some people are liable to the disease and others, although apparently living under similar conditions, are not. Hence if individuals are to suffer from rheumatism, the disease manifests itself very early in life.

Bosanquet, in the article quoted at the beginning of this editorial, analyzes 450 cases which occurred at Charing Cross Hospital, London, in the eight years prior to 1898. Nearly three-fourths of the whole number of cases occurred in patients who were in the second and third decades of life. Of the first attacks treated more than one-half the cases occurred between the eleventh and twentieth years, although rheumatism is often thought to be a disease especially of later life. People who live an outdoor life subject to the inclemencies of the weather—cabmen, car-drivers, railroad-men and the like—were not found to constitute the majority of the patients. On the contrary those who follow an almost exclusively indoor occupation, clerks, house-servants, etc., were the favorite victims. It is well recognized all over the world that domestic servants form a good part of those especially liable to rheumatism. Their indoor life predisposes to anemic conditions and in some way through this to rheumatism. It is well known to what an extent anemia may develop as a consequence of rheumatism; anemia appears also to be a favorable predisposition to the disease.

In a word it would seem that most of the notions connecting rheumatism with dampness must be modified. No season gives assurance against the disease and those who, because of previous attacks, are known to be predisposed, must avoid overexertion and fatigue at every season. The influence of heredity in rheumatism is hard to estimate, for every painful joint condition, from flat-foot to occupation neurosis, or the relics of an old dislocation, has been called rheumatism in the past and would surely be counted as such in the family history.

It would seem, however, that more than one attack of acute rheumatism in previous generations indicates the existence of a family tendency that should lead to the exercise of careful prophylaxis as far as possible. Active prophylaxis consists much more in the avoidance of run-down conditions than too great solicitude about damp surroundings. Air and sunlight are the best prophylactics and confinement to the house even in damp weather, far from being protective, is probably an incitant of the disease.

#### ESCAPED GAS AND HEALTH.

The last meeting of the New York County Medical Society for the year had for the subject of its scientific proceedings an extremely important and unexpectedly interesting matter. The Symposium on Gas Leakage in Large Cities from the standpoint of the gas expert, and certain clinical suspicions, open up a new field of what may be called city pathology. To most people and to none more than to physicians, it must come as a distinct surprise to learn that there is such an immense amount of gas leakage in our large cities. Millions of cubic feet per day lost from the mains is the statement that boards of directors of gas companies have periodically reported to them. Modern conditions in our large cities have made this of even more serious significance than it was some years ago. The impermeable sidewalk and pavement of asphalt now make the ready diffusion of escaped gas into the atmosphere an impossibility. The consequence is the imprisonment of the gas beneath the streets to find an exit wherever it can into subways, sewers, and through the cellar walls of neighboring houses.

This produces a condition of affairs that is eminently undesirable. The illuminating gas of the present time is an extremely dangerous poison. Modern improvements in its manufacture, far from making it less dangerous, have added to its toxic qualities and have rendered it more insidious in its effects. The introduction of the so-called water gas, now practically exclusively used as the basis of illuminating gas, has cheapened the cost of production but has greatly added to the amount of carbon monoxide present in gas. This material is, as is well known, the most poisonous gas we may be brought in contact with in ordinary life. It is what is called familiarly the "blue gas" that may be seen burning above a coal fire, and its presence, even in minute quantities in inspired air, causes an intense tired feeling and gives rise to loss of appetite and headache. Much of the lassitude that is felt in a room heated by a stove on a day when the action of a high wind interferes with the draft is due to scarcely more than traces of this gas present in the atmosphere. It is much more dangerous than carbon dioxide, though this latter gas is talked of so much more frequently. It is, in fact, the presence of carbon monoxide in considerable quantities that makes cases of gas poisoning so much more serious and more hopeless than they



were years ago. Prompt rescue of the patient and the employment of all the ordinary means known to medical science may prove unavailing against a fatal termination in these cases, even though the patient has not been long exposed and does not seem hopelessly depressed. Carbon monoxide is prone to produce such lesions of the central nervous system that recovery from them is impossible.

Dr. Lloyd adds to the seriousness of the picture by the cases he presents in which there is good reason to suspect gas poisoning. It is true that in Dr. Lloyd's cases the etiological element would seem to be sewer gas, not illuminating gas, but there are many reasons for adopting the opinion of gas experts that the pathological element in sewer gas is really the carbon monoxide of escaped illuminating gas. It is well known that excavations, in which the presence of asphyxiating gas is feared, may be considered safe if tests for the presence of carbon monoxide prove negative. Men who work in sewers do not suffer from the gases that are given off, and the atmosphere of large sewers like those of Paris is not laden with bacteria. The health of the workmen engaged in the London sewers or on the immense sewage farms outside of Berlin is better than that of the average of the general population, as has been proven by carefully kept statistics. These workmen seem to suffer from the infectious intestinal diseases, such as typhoid fever and dysentery, even less than the same class of working people engaged at other occupations.

It would seem fair, then, to assume that the presence of the extremely diffusible and intensely poisonous carbon monoxide from escaped illuminating gas is the cause of the pathological conditions usually attributed to sewer gas. On that assumption there is good reason for serious alarm over the present gas leakage in large cities as an element of danger to health. There are many anemic conditions constantly brought to the notice of the family physician in cities for which it is extremely difficult or even impossible to find a satisfactory reason. At times these conditions are accompanied by fever, loss of weight and appetite, and by constitutional symptoms that make them dangerous. Dr. Lloyd's cases would seem to be suggestive of at least one possible explanation, which is usually overlooked. While sewer gas is sometimes spoken of in general as a pathogenetic factor it is seldom thought of as the causative element in a particular case.

The present state of affairs with regard to gas

leakage demands decisive action on the part of city boards of health. As in England there should be some standard of the allowable toxicity of illuminating gas, for the tendency of the gas companies at the present time is to furnish an ever increasing proportion of the undesirably dangerous "water gas." It is probable that the frequent complaints of the poor quality of illuminating gas furnished at busy seasons in New York City are due to the failure of the companies to properly dilute and carburet the water gas supplied. Now that the building of the underground road has given the opportunity for a full and detailed knowledge of the situation of gas pipes in our principal streets and for their proper location within easy reach, it would seem that an earnest effort should be made to prevent the present enormous gas leakage. Meantime the direction of the attention of physicians to this important possible source of pathogenetic elements will undoubtedly lead to more definite knowledge as to the dangers involved and furnish opportunity for more careful clinical investigation of many obscure cases of anemia and neurasthenic conditions that have hitherto baffled explanation.

City life is distinctly more dangerous than life in the country. The average age of death, for instance, in Paris, in 1900, was a little over thirty-one years while the average age in the country places of France was nearly thirty-six years. Many accidental traumatic factors contribute to this shortening of human life, but most of the reduction of the age limit is due to the pathologic conditions of overcrowding, insufficient air, chances for infection, etc. No effort must be spared to correct this state of affairs since the present trend of population is towards centralization in crowded centers. One of the most important hygienic elements of city life is the purity of the inspired air, and this cannot be improved unless the deleterious contents of gas mains are prevented from finding their way as easily as is at present the case, into dwelling houses and office buildings. Every element of danger must be realized, and its amelioration carried out, if the present living conditions are to be materially improved and the death rate kept low notwithstanding the increase of population.

#### "KEEP OUT OF THE MIDDLE OF THE ROAD."

Now that the dog days are upon us and Sirius is blazing with fiery eyes from the cloudless sky, it is well for us to pay a little more attention to the common laws of health, to what we eat and

drink, to what we wear, and above all to what we do. For it is the doing of the American individual that leads to his undoing as a business man, that fills the "rest cures" with patients and chronicles so many "break-downs," at just the age when as a bread-winner, he should be at his best.

It is not a question of hard work, nor even one of overwork, for of these the human body and mind can endure much, nor is it alone carking care, which has killed more than the proverbial cat, but it is a steady and unrelaxing attention to one subject, a devotion to details of daily occurrence, and a fixed routine that go to making up the pace that kills. For in carrying any load it is as necessary to "change hands" with the mental concentration that has by long habit grown to be a part of us, as it is to relax the muscles which have become cramped and stiffened by physical labor. The exhausted muscular tissue loses its contractile strength and refuses to respond, while the mental process becomes one-sided, and predominant to the exclusion of the others, like sweet bells, jangled, harsh and out of tune, until the wages of these sins, if not death, are often despondency, depression, and nervous prostration.

It is not necessary to relinquish one's business entirely or to take an opera box for a season. What is needed is a change of scene and surroundings, at intervals a new employment of sufficient interest to keep the mind and body refreshed—something between the collection of postage stamps and ping-pong—be it golf or tennis, prize editions or book plates, according to the taste or income of the individual. We have all read of Bret Harte's "heroine who lost her life from an inability to ride three horses to oncet." To few of us perhaps is that power given, but we can all mount two hobbies—our business and our pleasure—and the oftener we change the relays the longer can we keep the saddle, and the firmer will be our grasp on the reins of both.

If this is true in the brisk, invigorating winter, it is still more so in the moist, muggy relaxing days, days that try men's souls and where the very breeze that keeps us cool, shows between the blades of the whirling fan, the familiar background of the setting of our daily toil. If we cannot escape all this for a length of time sufficient to be dubbed and dignified as a vacation, and to establish ourselves permanently as "rusticators," we can at least steal a day or so at a time and become "trippers." If we are doomed not to feel the kick of the heavy rifle against our very shoulders, or to hear the spin of the revolving

reel, there are always links within reach and steamers which go down the bay, to say nothing of the easily attained delights of the suburban philosophy of Omar Khayyam—"A book of verse underneath the bough, a jug of wine, a loaf of bread."

As to the latter, however, in these piping days of peace and heat, it is well to be moderate—enough is as good as a feast, and as a nation we not only eat too much but too often. In the primitive days when the woods were full of both Indians and game, and it was generally a mooted question which should be shot first, the hours of refreshment were irregular and the supply uncertain; but now our meals have become fixed feasts and often also serve as a time-killing device, so that we rarely leave the table without a feeling of repletion, and we are seldom really hungry ere we eat again. Thus the daily taking in of a little more than can be used or assimilated leads to an overworking of the liver and a distension of the stomach, while the circulation of a hyperplastic blood produces torpor and sluggishness and the general putting on of katabolic flesh.

The summer will not last forever, but it is to be followed by the winter's work, so that now is the time for us to see that we meet it in a logical and sensible way, paying out as little of our health and power of resistance as we can until the heat of the day has passed and the unblushing Sirius winks his other eye on the migrating swallow's homeward flight.

So let us eat but to live, and avoiding routine, both physical and mental, cling to the bridle paths and the unaccustomed by-ways of life, while we shun the beaten high-road, with its well-worn "ruts."

## ECHOES AND NEWS.

### NEW YORK.

**The Lying-in Hospital.**—During the past month the new Lying-In Hospital, Seventeenth Street and Second Avenue, has again illustrated the foresight of its founder. Of 182 applicants for ward treatment, it has admitted and cared for 155. The number of children born in the hospital in July was 104. During the same period in the out-door department 325 persons applied for assistance in their own homes; 239 patients were treated in confinement; 1,120 medical visits were made and 1,089 visits for assistance and aid, 268 patients being found so absolutely destitute as to require extra assistance during their illness, each being helped by a trained nurse and a scrubwoman, who cared for the rooms and performed various household duties.

**Increase of Insanity.**—During the summer months there is always an increase in the number of patients taken to the insane pavilion in Bellevue Hospital. This summer, however, has broken all records. One day



last week fourteen patients were put in the ward, ten of whom were women. On Wednesday of last week four men and four women were admitted, and on Tuesday four men and seven women were taken there. The average number of insane patients received at the hospital daily has been eight this summer. Formerly the average has been three. The proportion of women admitted this summer has been greater than ever before. In previous years the number of men and women has been about the same. This year about 75 per cent. of the insane patients are women. Dr. Packer, who is in charge of the insane pavilion, is reported to have said that he was at a loss to explain either the increase in numbers or in the percentage of women patients. He said also that more cases of incurable insanity are being received than ever before.

**Regulations Regarding Mad Dogs.**—President Lederle of the Board of Health is drafting a new section for the Sanitary Code, to take the place of No. 95, relating to dogs. The present section provides that when a dog that has bitten a person is mad, or shows signs of hydrophobia, it shall be killed. When Commissioner Lederle's changes are made, the Board of Health will be empowered to keep such dogs under observation for ten days in the laboratory at the foot of East Sixteenth Street. If it is decided that they are not mad, they will then be returned to their owners, but if they are mad or have symptoms of hydrophobia, they must be killed. The new section will also make it unlawful for the owners of such animals to take them out of the jurisdiction of the Board of Health. The change is in line with the recommendations of the most advanced experts. Only by keeping and observing the dog is it possible to determine whether it is actually the victim of rabies, a point on which the treatment of the victim absolutely depends.

**Status of Coroners' Physicians.**—A peculiar legal argument was waged this week in the Supreme Court before Justice Greenbaum, who may give a decision which would force all the coroners' physicians in Manhattan out of office, whether they have passed a civil service examination or not. The point was raised as a result of the effort by friends of Dr. Otto E. Schulze to secure for him the position of coroner's physician to fill the vacancy caused by the resignation of Dr. Hamilton Williams. Dr. Schulze stands first on the eligible list of the Civil Service Commission, but the commission certified to the Board of Coroners the name of Dr. S. E. Whitman, who was on a preferred list, by advice of the Corporation Counsel, because the position which he had held in the borough of Richmond had been abolished by a reduction in the number of coroners. The board refused to appoint Whitman, and he applied for a writ of mandamus. Edgar M. Leventritt argued for him, citing the mandatory provision in the charter that persons put out of civil service office by abolition of positions should be appointed to the first vacancies. Lawyer Russell argued for Dr. Schulze that the law gave to each coroner the right to appoint his own physician, and if the charter took away this right under color of holding that the physician was under the protection of the civil service law, then the provision was unconstitutional. Mr. Leventritt answered this argument by declaring that if the point were well taken it would mean that none of the coroners' physicians in Manhattan held his office legally, none of them having been appointed by the present coroners. Mr. Russell said that the duties of a physician in Manhattan are very different from those in Richmond. Justice Greenbaum asked counsel to submit affidavits as to the similarity of duties in Manhattan and Richmond, and reserved decision.

## PHILADELPHIA.

**Medico-Chirurgical Hospital.**—A model emergency ward has just been completed at the Medico-Chirurgical hospital. Emergency cases were formerly treated in the regular wards on the upper floors. The new ward has been formed from the front part of the basement at a cost of \$2,000 and contains 16 beds.

**Coatesville to have New Hospital.**—A new hospital to cost \$60,000 will be erected in Coatesville, Pa., ground having been broken the first week in August. The building will be situated on an elevation south of the borough where the best of water, ventilation, and drainage will be secured. This hospital is the outgrowth of the Huston Memorial hospital established three years ago.

**Restrictions on Drunkards at Philadelphia Hospital.**—Only unusual cases of drunkenness are to be admitted to the Philadelphia hospital in the future, the new regulation being designed to prevent habitual drunkards from making their home in the hospital. The increase in the population of the almshouse and hospital from 3,000 to over 4,000 during the last few years has been largely due to laxity in the regulations regarding the admission of intoxicated persons. The new rule is intended to reduce largely this number.

## CHICAGO.

**Resignation of Dr. Tracy.**—Dr. Evert E. Tracy, resident physician at the Joliet penitentiary, has resigned for the purpose of re-engaging in private practice in Chicago.

**Deaths of the Week.**—Notwithstanding the typhoid fever epidemic, the 555 deaths reported during the week were only 10 more than during the previous week, and there were 54, or nearly 30 per cent. fewer deaths of infants. The death rate per 1,000 was 15.92, which compares unfavorably with that of the previous week, 15.60, and with 13.87, the rate for the corresponding week of 1901.

**Warning Against Typhoid.**—The Department of Health issues an urgent warning against typhoid fever. Typhoid fever is more prevalent in Chicago to-day than it has been at any time since 1890 to 1892. The department wishes to shock the public into some realization of the nature and the sole cause of the disease. Every case results from taking into the stomach poison from the intestines of some previous patient. The disease can be contracted in no other way. The poison is most frequently conveyed by typhoid-polluted drinking water. At present, however, in Chicago it is feared that milk, vegetables and fruit are also polluted by excessive rainfall over the city and adjacent territory. This has flooded sinks and vaults, and has poured the filth accumulated during previous dry months into the streams and wells that furnish water for washing dairy utensils, and over fields of growing vegetables.

**Dunning Needs Cash.**—The responsibility for conditions at the Dunning Insane Hospital making it possible for a patient to be fatally injured a few days ago in a fight with other patients, is placed by Dr. Hugh T. Patrick on an apathetic public which has failed to provide the patients with adequate accommodations for a sufficient number of attendants. Dr. Patrick's statements are based on his own observations as a member of the committee which several months ago studied the needs of the institution, and made suggestions for the reorganization of its medical staff. Dr. Patrick says the quarters should be doubled.

**Regulations Concerning Medical Education in Illinois.**—The Illinois State Board of Health has drawn up a schedule of minimum requirements for the regulation of medical colleges. The conditions of admission

to lecture courses are (1) A certificate of moral character, and (2) evidence of preliminary education, of which a high school diploma represents the minimum requirement. Admission to advanced standing is based upon an equivalence of work done in other institutions recognized by the State Board. The curricula of the medical schools are to embrace four years of instruction, aggregating at least 40 months. The branches of medicine to be embraced in the course of instruction must include at least the following: (1) Anatomy, (2) Physiology, (3) Chemistry, (4) Materia Medica and Therapeutics, (5) Theory and Practice of Medicine, including Ophthalmology, Otology, Dermatology and Neurology, (6) Pathology and Bacteriology, (7) Surgery, including Orthopedic Surgery, (8) Obstetrics, (9) Gynecology, (10) Hygiene, (11) Medical Jurisprudence (Forensic Medicine). The regulations also prescribe dissection, lectures, clinical courses, and regular attendance on the part of the student.

#### CANADA.

**Toronto and Montreal Smallpox Records for 1902.**—Since January 1 Montreal has had to deal with no less than 500 cases of smallpox, while during the same time Toronto has had only 28 cases. There have been no cases in Toronto for some time, but Montreal has now 18 cases. Since January 1 there have been 11 deaths from the disease in Montreal; in Toronto, one. Out of the total of 500 cases in Montreal, 432 had never been vaccinated.

**Appointments.**—Dr. Goldwin Howland of Toronto has been appointed registrar of the National Hospital for Nervous Diseases, London, England. Dr. Telephore Parizeau has been appointed professor of pathology and surgery at Laval University, to succeed the late Dr. Brunelle. Dr. Parizeau is a graduate of Laval and for some years after graduation he walked the hospitals of Paris. He is a member of the visiting staff of the Notre Dame Hospital.

**Canadian Medical Association.**—The provisional programme of the thirty-fifth annual meeting of the Canadian Medical Association, which meets this year on September 16, 17 and 18 in Montreal, has been prepared and issued. Among those who will contribute papers to this meeting are Dr. William Osler, who will deliver the address on Medicine; Dr. John Stewart, Halifax, N. S., the address on Surgery; Dr. William Corlett, Cleveland, who will conduct a lantern demonstration on the exanthemata; Dr. James Stewart, George E. Armstrong, A. D. Blackader, James Bell, Laphorn Smith, F. A. L. Lockhart, David A. Shirres, Montreal, Alexander McPhedran, George A. Peters, A. Primrose, G. S. Ryerson, F. N. G. Starr, G. H. Burnham and D. C. Meyers, Toronto, Dr. Alexander Hugh Ferguson and Dr. Casey A. Wood, Chicago, Dr. A. R. Robinson, New York, Dr. O. M. Jones, Victoria, B. C. The entertainment committee has provided a fine programme, and numerous clinics will be held at the various Montreal hospitals during the course of the meeting. A very large meeting is looked for.

**Obituary.**—Dr. Horsey, Liberal member of Parliament for the constituency of North Grey, was accidentally killed a short time ago by the bursting of a flywheel at the Owen Sound Cement Works. He was a graduate of Queen's University, Kingston. Dr. J. C. Prieur of Coteau Station, Que., died on the 9th inst. He was born in 1869 and was graduated from Laval University, Montreal. Dr. Thomas Christie, M.P., died at Lachute, Que., on the 5th of August. He was born in 1824 in Glasgow and was graduated from McGill University in 1848. Dr. J. A. S. Brunelle, Professor of Pathology and Surgery in Laval University, Mon-

treau, died suddenly at his summer residence at Mountain View, New York, a short time ago. He was born in 1852 and was for over 27 years a physician to the Hotel Dieu Hospital.

#### GENERAL.

**Dr. Guiteras' Return.**—Dr. G. M. Guiteras, the yellow fever expert of the United States Marine Hospital Service, after an absence of three years in Cuba, arrived in New York on the steamship Olinda this week. Dr. Guiteras has been ordered to Philadelphia. He stated on arrival that Havana and Matanzas were in excellent sanitary condition.

**Bismarck's Physician.**—It is reported from Berlin that Dr. Schweninger, the well-known physician to Prince Bismarck, has been appointed Professor of the History of Medicine in the University of Berlin. Bismarck, who was always a great admirer of the Munich physician, sought to procure for him a chair in the University as long as 20 years ago, but failed, owing to the opposition of the faculty. Schweninger has neither written nor lectured upon the subject of which he is to become professor.

**Dr. Lung Surgeon to the President.**—Dr. George Augustus Lung, Surgeon U. S. Navy, has been selected by the Navy Department for duty as Surgeon to the President to succeed Dr. John F. Urie, who was made Assistant Chief of the Bureau of Medicine and Surgery. Dr. Lung entered the naval service in 1888. He was born in New York. His excellent record and active service commended him to the Navy Department for his new assignment. He is now on waiting orders in New York, having been detached from active service last December.

**A Safe Age.**—The insuring of one's life is most apt to be put off. There are few, however, who postpone what ought to be the inevitable until so late a period in life as did the tough old smackowner of Grimsby, England. When he presented himself at the insurance office he was naturally asked his age. His reply was "Ninety-four." "Why, my good man, we cannot insure you," said the company. "Why not?" he demanded. "Why, you are ninety-four years of age." "What of that?" the old man cried. "Look at statistics, and they will tell you that fewer men die at ninety-four than at any other age."

**Tuberculosis and Medical Students.**—Yale men have received word that Dr. H. F. Scofield of Bridgeport, Conn., is dying from consumption in Denver. He was a student at Yale until three years ago. He made a specialty of the study of tuberculosis. Out of a class of forty-four he is the eleventh to contract consumption while endeavoring to discover a remedy for the disease. Scofield, while here, sought out the most aggravated cases for treatment. He was indefatigable in the work of the Yale Medical School until he contracted consumption, when he had to go West to finish his medical studies in Denver.

**Cholera in Japan.**—It is reported that the epidemic of cholera has spread from Manila and the ports of China to Japan. Up to the middle of July cases and deaths had been reported officially as follows: Tokio, 4 cases, 3 deaths; Saga, 75 cases, 42 deaths; Nagasaki, 3 cases, 3 deaths; Fukuoka, 102 cases, 73 deaths; Fukuoka Jail, 27 cases, 12 deaths; Formosa, 19 cases, no deaths; total, 231 cases, 142 deaths. The number of cases in Fukuoka Ken up to July 16 was 121, of which 93 were fatal. A Tientsin dispatch of July 11 says that the number of cases in the city up to that date was 1,049, of which 764 were fatal. The total in the northern section was 1,015, with 593 deaths. The epidemic is abating.



**Psychopathic Hospital Work.**—Under the auspices of the trustees of the Psychopathic Hospital, a department of the New York Infirmary for Women and Children, a collection of psychopathological researches treating of mental dissociation has been prepared by the director of the laboratory, Dr. Boris Sidis. Dr. Sidis was formerly associate in psychology of the Pathological Institute of the New York State hospitals. The book consists of a series of experimental studies in the domain of abnormal mental life. The Psychopathic Hospital is a recently established institution for the observation and treatment of patients in the initial stages of mental derangement. The project received the support of the New York State Board of Charities.

**Site for the King's Sanatorium.**—A site of 120 acres at Lords Common, near Midhurst, Sussex, has been selected for the King's Sanatorium, the erection of which was made possible by the munificence of Sir Edward Cassel. It would be difficult to find a more healthy place. The elevation ranges from 500 to 600 feet above the sea level, in the midst of charming scenery and a pine forest, and it makes an ideal site for a sanatorium. The contract for the water supply has been intrusted to Messrs. Duke and Ockenden, of Littlehampton and London, who are commencing operations immediately. The plans for the sanatorium itself have not yet been selected. It is intended that it shall be the most scientifically constructed and equipped building for its purpose in existence.

**Barbers Again.**—In order to prevent any possibility of contagion from the use of barbers' implements, the Board of Health of Orange, N. J., has ordered that barbers shall thoroughly wash all brushes, combs, razors, and other utensils used by them in boiling water before beginning business each morning. After finishing with each customer, a barber, before using a razor again, must thoroughly wash it in an antiseptic solution. The board also has adopted a rule requiring saloon or restaurant keepers to wash thoroughly in water which has been used for no other purpose every glass or drinking vessel before serving a drink. A penalty of \$10 is fixed for every violation of either order, and the board will have inspectors at work to see that the provisions are obeyed.

**Obituary.**—Dr. Nicholas Williamson, Mayor of New Brunswick from 1896 to 1902, died August 15 of typhoid fever and the results of overwork. He was fifty-four years old. He studied medicine while paymaster in a local button factory, and became a leading physician of New Brunswick. In 1884, when the city was threatened with bankruptcy, he was a prominent member of the committee which saved its credit and prevented repudiation. All the flags in the city were placed at half-mast, and the day of the funeral was observed as an occasion of public mourning.

Dr. Leopold Schenck, famous for his theory on the determination of sex, died August 18, at Schwanberg, in Styria. That the sex of children could be determined by the dieting of the mother prior to the child's birth was the theory with which Dr. Schenck astonished the world in 1898. He was at the time Professor of Embryology in the University of Vienna, and his doctrines received very serious, though generally incredulous, attention from medical men in all parts of the world. Since that time Dr. Schenck has frequently discussed his theories in public. He has published a volume entitled "The Determination of Sex." His colleagues in the Vienna institution of learning finally became convinced that the doctor was seeking notoriety, and last year he was retired on a small pension. It is said that this completely crushed his spirits. The keynote of Dr. Schenck's treatment was diet. He held that mothers

desiring sons should abstain from the use of sweets and other rich foods. He said that the sex of a child was dependent upon the number of corpuscles in the mother's blood.

## CORRESPONDENCE.

### CELIOTOMY ON BATTLE-FIELD.

*The Editor of the MEDICAL NEWS:*

DEAR SIR.—Will you kindly allow me to correct a statement of Dr. Grant, on page 1158 of your journal of June 14, 1902? The statement is:

"Dr. Grant of Louisville had just come from the meeting of the Army Surgeons and said that they were of one opinion, viz., that successful laparotomies could not be done on the field of battle."

I, for one, am not of any such opinion as evidenced by my paper, "A Further Consideration of the Necessity for Immediate Celiotomy in Penetrating Gunshot Wounds of the Abdomen in War," read by title before the Association of Military Surgeons of the United States, June 7, 1902, and briefly reviewed in the Medical Record, August 2, 1902, page 200. This paper will appear later in the Journal of the American Medical Association. I not only believe in celiotomy on the battle-field but have done it there successfully.

CHAS. E. B. FLAGG,  
Captain, Assistant Surgeon U. S. Army.

Fort Grant, Arizona, August 13, 1902.

## TRANSACTIONS OF FOREIGN SOCIETIES.

### French.

**PYROPLASMOSIS IN THE DOG—SYMPTOMS OF HYDATID INTOXICATION SECONDARY TO AN OPERATION FOR HYDATID CYST OF THE LIVER—GANGRENOUS APPENDICITIS—ACQUIRED EXSTROPHY OF THE BLADDER THROUGH THE NATURAL PASSAGES—HYDATID CYST OF THE KIDNEY TREATED BY PARTIAL EXTERPATION OF THE KIDNEY—STRANGULATION OF THE INTESTINE BY BAND—SYPHILIS, TABES DORSALIS, GENERAL PARALYSIS AND THE PUPILS—LOCAL TREATMENT OF ISOLATED RHEUMATISM.**

NOCARD at the Academy of Medicine June 7, 1902, read a paper on pyroplasmosis in the dog. He said that he had been studying this subject with Professor Motas of Bucharest. He defined the malady as characterized by the presence of organisms in the blood which are transmitted to the animal by the bite of insects similar to the tick. The affection manifests itself by fever, bad temper, prostration, blood in the urine, jaundice, and finally in the grave forms, death after a few days. In the light form there are present only profound anemia and muscular weakness, and recovery as a rule occurs after two or three months. The examination of the blood gives the explanation of the symptoms observed. The number of red blood cells undergoes a considerable diminution. A certain number of them contain one or more parasites comparable to those which are found in animals sick with Texas fever, as described by Smith and Kilborn. The disease is artificially transmissible by injection into the veins or the cellular tissue of the blood containing the parasite. Dogs which have once recovered from the malady remain immune to it for the rest of their lives, so far as this observer has been able to study this point. As to the precise mechanism of recovery he stated that it does not differ materially from that seen in other germ diseases, and consists essentially in a process of phagocytosis. There is this difference, that in these other diseases this process is confined ordinarily to the

mononuclear white cells, while in pyroplasmosis it is carried out almost altogether by the polynuclear. The serum of animals which have recovered from the disease possesses the property of destroying the poison of it *in vitro*, or of decreasing the poisonous effects. This again is similar to facts observed in other diseases except in the point that this characteristic of the serum is destroyed by heating it to 56 or 57 degrees C. The serum of dogs possesses equally a preventive action. If injected in large doses 12 or 24 hours before inoculation with the virus the death of the animal is either delayed or entirely prevented.

LEZARS at the Society of Surgery June 11, 1902, read a contribution on the symptoms of hydatid intoxication secondary to an operation for hydatid cyst of the liver. He stated that the cyst was situated on the inferior surface of the liver; had no complications; was indolent, and required operation only on account of the mechanical inconvenience of its size. His technic was the following: After incision of the abdominal wall and free exposure of the cyst itself, he punctured it, but as evacuation did not occur easily he incised it freely, unfortunately without first taking the most minute precautions to isolate it from the abdominal cavity. The operation ended by removing the mother membrane in mass and a resection of the fibrous wall in part outside of this, followed by a simple reunion without drainage. The first day passed well enough, but on the evening of the second day the patient became pale, and on the following morning had increased in prostration and pallor. He had a pulse of 120 and a green vomitus. These symptoms continued and increased until that evening. The outer dressing was removed and the wound found to be in excellent condition, without any signs of infection. By means of injection of artificial serum the condition of the patient rapidly improved and two days after the injection he was on the high road to perfect recovery. The author frankly ascribes these unfortunate symptoms to hydatid intoxication due, no doubt, to failure to wall off the abdominal cavity at the time of the operation.

QUÉNU referred to a communication made before the Society by Walther at a recent session, and previously noted in these columns, on the subject of gangrenous appendicitis and concerning a young girl who presented only localized tenderness of mild degree at the point of McBurney, but in whom, upon laparotomy, a gangrenous appendix was found. Quénu stated that the following facts in this case were of great value. The young patient was examined by the surgeon only 24 hours after the beginning of the attack, at a time when she was somewhat stupified. It is well known that in all forms of peritoneal septicemia, grave peritonitis and gangrenous phlegmons of the extremities, there is a period of active pain, usually of short duration, succeeded by a temporary absence of tenderness, sometimes almost by a kind of anesthesia. In gangrenous appendicitis this phenomenon is apt to be especially well marked and was called by Dieulafoy "the period of treacherous calm" (*accalmie traîtresse*). Another point to which Quénu desired to call attention in gangrenous appendicitis is that it is necessary to know that the diffusion of pain is present usually during the first 20 or 24 hours of the disease. This fact alone possesses great clinical value in his experience.

PROUVE discussed a case of acquired exstrophy of the bladder through the natural passages. He had occasion to observe one in a woman about 15 days after Guinard had removed an epithelioma from the urinary meatus which had extended up the urethra. The exstrophy appeared as a small tumor, making the vestibule prominent. This mass had increased rapidly

in volume; at first reducible in the horizontal position, it had shortly become irreducible and caused absolute loss of control of the urine. When he examined the woman the tumor was the size of an ordinary orange and appeared to be made up of the entire bladder wall, which projected between the lips. It was red, tender, and presented the usual folds of the bladder wall. The orifices of the ureters could easily be seen at its lower part. To cure this acquired exstrophy he made use of the following operation: After a median abdominal incision and a reduction of the bladder, he sutured this with silk just in front of the womb, which itself was retroverted. Then he made a hysteropexy. The operation was ended by an endeavor to decrease the orifice of the urethra, but without success. The prolapse of the bladder has up to the present time not returned, but the incontinence of urine is still present because in removing the epithelioma the sphincter muscle was sacrificed inevitably.

TERRIER presented a woman of thirty-three years, who had suffered from a hydatid cyst of the kidney, which apparently developed along the lower surface of the liver. He thought possibly it was attached also to the kidney, and therefore made a lateral laparotomy and found that the cyst was entirely independent of the liver and situated in the extraperitoneal fat upon the kidney at its lower extremity. He freed the kidney from its attachments and carefully removed that portion which was the seat of the cyst. He confessed to having made the mistake of puncturing this cyst before its removal, and without having taken any precautions to prevent infection of the wound by its contents. Perceiving the error, however, he flushed the wound out with a strong solution of bichloride of mercury in order to combat the toxin.

ROCHARD read a paper before the Society in the name of G. de Rouville of Montpellier, upon a case of strangulation of intestine which had been in a hernia and reduced by taxis. The vomiting of fecal matter continued after the reduction, so the patient was taken to the hospital and an operation done to find out what was the cause. When the sac was exposed he found that the strangulation was not caused by a reduction of the hernia in mass, as he had at first feared, but by a band within the abdomen and independent of the sac. Unfortunately the patient was in a grave condition and died before the operation was completed. The operator practised, without success, direct massage of the heart. An autopsy showed without doubt that the strangulation had been caused by the band.

DUFOUR, at the Medical Society of the Hospitals June 13, read an instructive paper on the relations existing between symptoms of the pupils and syphilis, tabes dorsalis and general paralysis. He has been making observations on 1,100 patients, adults and aged, afflicted with various diseases, especially with the three named, with reference to the reaction of the pupils. Of these subjects 99, of whom 80 were men and 19 were women, had acquired syphilis. Simple inequality of the pupils as an isolated symptom appeared to him to be usually independent of syphilis or of the other nervous diseases mentioned previously. Its significance clinically is usually of only slight value. On the other hand, a deformity of the pupil serves in a large number of cases to indicate syphilitic infection or to suggest those diseases usually called parasymphilitic. The Argyll-Robertson pupil he has observed only in syphilis, general paralytics and tabetics. Among these 80 syphilitic men there were not more than one-quarter whose nervous systems had suffered either by the true syphilitic or the parasymphilitic affections. These results confirm in general terms the opinions of Babinski to the



effect that there is some relation between syphilis and the Argyll-Robertson pupil and deformity of the pupils, especially in the presence of tabes, general paralysis, or syphilis itself.

BOUCHARD, at the Academy of Sciences July 15, 1902, read a paper on the local treatment of isolated rheumatism. He considered the essential advantages of treating locally, if possible, all the local manifestations of general diseases, and in fact, of local diseases also. Among others he had been making observations upon local rheumatism; he had injected beneath the skin salicylate of soda in a solution of 5 per cent. when the cellular tissue alone was slightly affected, or when there was a local arthritis or neuritis. He has found such injection comparatively painless, and the dose may be made, according to the extent of the lesion, from one to four injections of one to two c.c. each. Occasionally a single injection will be sufficient to bring about a cure, but it is necessary to commence the injections again if the first fails by the end of the second or third day. If there are several local sites of the disease he takes each one in turn, and if there are many he treats several at one sitting. In general, he stated that though these local injections cure the disease at the point of application, they do not appear to have any affect whatever on the systemic course and evidences of the attack. It possesses one advantage probably, and that is, under certain circumstances other parts of the economy are spared by the use of the medicine at the seat of the disease.

## SOCIETY PROCEEDINGS.

### BRITISH MEDICAL ASSOCIATION.

*Seventieth Annual Meeting, Held at Manchester,  
July 29, 30, 31, Aug. 1, 1902.*

(Concluded from page 324.)

**Carcinoma in Women.**—Professor William Japp Sinclair selected Carcinoma in Women, chiefly from its clinical aspects, as the subject of his Address on Obstetrics. The greater comparative frequency of occurrence of cancer of the generative organs in women than in men was pointed out, as a possible clew to the etiology of carcinoma in general. We search in vain through the recent manuals of gynecology and even of pathology and the records of pathological investigation, for any hint of progress in the evolution of an etiology of malignant disease of the internal sexual organs of women. Of histology there is enough and to spare, but of pathology in the narrower sense there is little to arrest attention, much less to satisfy; and there is absolutely nothing to indicate an advance from the position of a former generation of pathologists. The nomenclature is new—the thoughts and principles are old. There would, in fact, be a certain amount of truth in the allegation that the diligent pursuit of the histology of malignant growths and other tumors has distracted the attention, the activities, and the energy, to say nothing of the intellectual force, which might have led to a true pathology of cancer of the uterus by fixing the attention upon structure, growth and extension in relation to clinical phenomena. We have heard too much of cancer as neoplasm, too little of it as a disease. If, now, we set aside all considerations of the etiology and pathology of cancer of the uterus and keep in mind only the clinical aspects of the disease, we see much ground for congratulations on the achievements of the last quarter of a century. The clinical work has been wholly surgical. What is not surgical is futile—it is hardly knowledge.

**Results of Surgical Treatment.**—Vaginal hysterectomy, when the disease is confined to the uterus, is not now more dangerous than an ordinary ovariectomy. The mortality, which at one time was 30 per cent., has now sunk to 3 or 5 or 7 per cent., according to the extent of the disease and the concomitant complications or derangements of health.

In recent years there has been a wave of depression passing over the gynecological world on account of the unfavorable remote results of vaginal hysterectomy for cancer, and the most optimistic will admit that there has not been much ground for satisfaction. At a recent Congress of American gynecologists one of the members said: "There are some men who claim for total extirpation of the uterus the happiest results. . . . Other men have looked upon the matter with utter hopelessness. . . . I am sorry to say that I have brought myself among the latter class from bitter experience."

But so far from the pessimistic view being the true one, the results obtained by many of the best-known operators continue to improve and to give the greatest encouragement to continued efforts in the future. They are obtaining better immediate results, and the number of "cures" increases—that is, the percentage of immunity for at least five years after operation becomes greater. The percentage of cases operable when first seen also increases, because the patients come earlier for treatment, and improvements in technic have extended the indications. The proof of all this lies in the statistics of carefully-reported work done under circumstances in which the sources of error are reduced to the minimum.

The most remarkable figures of all are those given by Schuchardt as the results of the paravaginal operation. The best results before were those of Leopold in Dresden, who with an operability of 20.4 per cent. had 50 per cent. of conventional "cures." Schuchardt raised the operability to 61 per cent. and had conventional cures to the extent of 40 per cent. In easy cases he had the astonishing results of 80 per cent. of cures.

**Abuse of Operative Methods.**—One of the results of the depression arising from the recognition of the unfavorable remote results of vaginal hysterectomy has been a rush, especially in Germany, to the extreme verge of the practical in dissecting out not only the internal sexual organs but the whole of the lymphatics and cellular tissue of the pelvis. This has been declared to be justified by the belief that better remote results would be obtained than by vaginal hysterectomy. From a careful and laborious attempt to keep up with the record of proceedings, I have no hesitation in saying that a large portion of the extended radical abdominal hysterectomies for cancer are murderous vivisections, which nothing hitherto advanced in their support appears to palliate, much less to justify. Most of the cases recorded have been too far advanced for any operation, however radical. I believe the presently existing pessimism is not justified by the facts, that there is much reason for encouragement to greater efforts in the future, and that our hopes must rest on early vaginal operation, not on the so-called extended radical abdominal sections.

**Increase.**—Among the preliminary considerations which call for attention comes the question: Is cancer of the uterus on the increase? My own firm conviction for a long time has been that it is not, in spite of all allegations to the contrary. Cancer of the cervix is a different disease from cancer of the body, and is a morbus miseris like osteomalacia, leprosy, and pellagra; it is bound to decrease as the social condition, the physical well-being, the freedom from worries, and the consequent comparative happiness of the people im-

prove. Cancer of the cervix uteri occurs almost exclusively among the poor, the chronically overworked and underfed, among prolific poor, harassed, worried, drained, reposeless women, that fissures of the cervix, neglected lacerations, tissue changes in the cervix, from flexions, irritations from venereal diseases, remnants of puerperal sepsis affecting the cervix, I have myself no doubt whatever. There is no time to argue the question, but each expression here used embodies an opinion, and has the foundations of a thesis which I am prepared to maintain and defend. But we cannot afford to remain supine and inactive while the process of evolution is going on. We have seen disease eradicated in this country by social legislation; for example, mollities ossium; but no legislation we can foresee will relieve our fellow countrywomen from the physical effects and the cares of large families, or save them from the consequences of their own negligence and from marital cruelty and selfish indulgences.

**Importance of Clinical Observations.**—It is my firm conviction that the secret of cancer in general will be discovered, if ever, by the study of carcinoma of the uterus, and that the means will be exact clinical observation, followed, perhaps, and corroborated by, experimental research. The microtome and the cultivation tube, and experimental implantation, have had their day; they need not cease to be, but they should find their proper place in our system of research. We may get at the causes of malignant disease, as far as we understand the causes of things, by exact clinical observation; but the specific remedy or the system of therapeutics will come, in all probability, as a stroke of empiricism from an individual working for the sake of knowledge. It might be argued that the pathology and serum treatment of tuberculous disease and diphtheria are examples to the contrary, but there appears to be hardly any analogy between the genuinely infectious diseases and the phenomena of cancer.

Cancer is infectious to the individual already affected with cancer, but to no other. The phenomena of rapid recurrence in the cicatrix after operation, owing to contact of the fresh wound with cancerous matter, points to an early cancerous condition of the system, an entirely different matter from the late cancerous cachexia.

**Application of Logical Methods.**—If we are ever to arrive at the causation of carcinoma of the uterus we must reach it by the rigid application of logical methods of induction to clinical work. We are already in possession of certain facts established clinically with regard to cancer of the body and cancer of the cervix, and the extent to which they are dissimilar. We might begin with carcinoma of the cervix. It is a diseased condition, with antecedents and characteristics almost entirely its own. Its characters fit it specially for clinical observation and the application of logical methods of induction.

**Conclusions.**—Running through all I have said has been an effort to attract attention to the dignity and the effectiveness of exact scientific clinical methods of observation. To do so it seemed necessary to contrast the futility of much of the labors of the past in order to establish the etiology and true pathology of cancer. All honest and enlightened human effort should be welcomed; I depreciate none. But chiefly is my hope fixed on the fact that in such research as I have been suggesting every member of the medical profession engaged in general practice could co-operate in genuinely scientific work with those whose daily occupation was of a special character. The work of both sets of workers would be complementary. The specialists have more time as a rule, and naturally have the particular disease more in their minds. The medical practitioner

knows most about the history and environment of the individual, and can obtain relevant information from which the hospital physician is excluded.

It is my earnest hope and desire that some of our younger men with more energy, better opportunity, starting on a higher level of knowledge, will professedly take up this great enterprise and see whether by calm, industrious, and enlightened clinical observation, alone or collectively, they can find out for mankind the cause and the remedy for this mysterious and dreadful malady.

**Smallpox and Vaccination.**—Dr. E. W. Hope of Liverpool presented a paper upon this subject and particularly dwelt upon its practical phases. Inasmuch as vaccination is a preventive measure, designed to protect the public health, there is, he said, no reason why its administration should not be incumbent upon the body which is responsible for the administration of all preventive measures designed to protect the public health. In the hands of such officers it could be more quickly and systematically administered. With regard to the performance of the operation itself there can be no doubt that the work of the public vaccinators is on the whole more efficient than the work of private vaccinators. Another important point for consideration is the question of the supply of lymph. The fact that lymph degenerates and becomes inert in time is sufficient reason for the establishment in populous centers of depots for the preparation of this lymph under supervision and control of the local government board. Parliamentary provision for revaccination is absolutely essential. This is best done during the twelfth year before the child leaves the elementary.

Doctors Seaton and Edwardes confirmed the statements made by Dr. Hope and cited additional statistics to prove the importance of revaccination.

**Inherited Immunity.**—Dr. John Gornall reminded the audience that all people were in some measure susceptible to smallpox and immunity was acquired or transmitted from parents. Such immunity was the cause of subsidence in the disease during intervals between epidemics. He explained the difficulty encountered in vaccinating the children of those who had been revaccinated.

**Absolute Immunity.**—Dr. Nash said there was no such thing as absolute immunity but fortunately recent vaccination furnished a very high relative degree of immunity. That the vaccination be efficiently done with fresh and potent virus in every case is of prime importance.

**German Vaccination Law.**—An efficient act was adopted by the German Government in 1874 by which it was provided that every child should be vaccinated during the calendar year succeeding the year of its birth, and every child in attendance upon a public or private school within the year in which the pupil has passed his or her twelfth year. The section of Public Medicine unanimously passed a resolution favoring revaccination at the age of twelve years.

**Functional Paralysis.**—A discussion on the Differential Diagnosis of Functional and Organic Paralysis was opened by Dr. Thomas Buzzard. Without attempting to define the word "functional," he said that he would apply it to cases of paralysis which simulated more or less closely those arising from structural alterations of recognized character, within or of the nervous system, without being dependent upon any that the most advanced means of investigation enabled them to distinguish; also that the term should be limited to cases of paralysis of a kind which it would be possible for at least some healthy persons to produce by voluntary stimulation. Functional paralysis could sometimes



—though by no means always—be removed rapidly or suddenly as a result of persuasion or physical or moral shock. Many symptoms were enumerated which were conclusive as to the existence of organic disease, but there were probably none which, unsupported, could be relied upon to establish a diagnosis of functional paralysis. Functional hemiplegia was rarely preceded by anything resembling apoplectic seizure; it was most commonly of somewhat gradual onset, and was principally differentiated by its failure to present that gradual passage from flaccidity to contracture which was characteristic of the organic form. It was prone to be associated with an amount of anesthesia far exceeding that usually observed in organic hemiplegia, except of that form in which there was lesion of the sensory tract in the internal capsule. The characteristic hysterical gait had been well described by Todd, to whom they owed also the observation that hysterical hemiplegia rarely, if ever, attacked the face. Babinski's "flexion combinée de la cuisse et du tronc" was an important test. In organic hemiplegia an effort to sit up in bed without the aid of the arms caused the heel of the affected side to be lifted, which did not happen in the functional form. Although a process of slow and gradual contraction was not prone to occur in the course of functional hemiplegia a strong contracture—without previous flaccidity—might take place, often suddenly, and present a very strong *prima facie* resemblance to the result of an organic lesion. But in true hemiplegic contracture of long standing he had pointed out that the whole arm could not be passively extended at one moment, but in the functional form the arm, hand, and fingers could all, by an effort, be brought into one plane. Inequality of the deep reflexes on the two sides could not be absolutely relied on to prove that the hemiplegia was of organic origin; and the same obtained with regard to ankle clonus, which was sometimes, though very rarely in the functional form, indistinguishable from that characterizing organic lesion. The absence of or difficulty in eliciting the plantar reflex in functional paralysis described by him 20 years ago was of great service as a negative sign in differentiating functional from organic paralysis. The "toe phenomenon" described by Babinski in 1896 was probably of still more importance, since it gave positive evidence of organic disturbance. The differentiating of monoplegia of functional origin was discussed, and it was shown that its differentiation might sometimes present insurmountable difficulty. Paraplegia rarely presented any serious difficulty, especially because of the aid to diagnosis afforded by the Babinski toe phenomenon and the absence of plantar reflex. The comparatively moderate and often transitory paralysis of a limb or limbs in insular sclerosis was often erroneously regarded as of functional character. He combated the idea held by some that these attacks of localized paralysis were at first hysterical and eventuated in organic change, and expressed the opinion that it was the attack of structural disease in the central nervous system which incidentally caused also hysterical symptoms. Not only physical shock, but the shock of structural disease, was prone to induce along with its immediately resulting symptoms others of a functional and often transitory character. In conclusion, he pleaded for the medical student receiving accurate instruction and study of the Babinski toe phenomenon as a most important means of differentiating organic from functional paralysis.

Sir William Broadbent, after alluding to the difficulty of differential diagnosis of the paralysis in early insular sclerosis, mentioned a series of four cases of functional paraplegia all due to suggestion by the same person. Extraordinary vascular changes shown in the color and volume of limbs affected occurred with func-

tional paralysis. Dr. Judson Bury emphasized the absence of any absolutely certain distinctive test, and showed that the term functional was in itself objectionable, as the unrecognized structural changes were probably identical with the early changes of organic paralysis. Dr. E. S. Reynolds alluded to the special difficulty of the differential diagnosis in cases of railway injury. Ankle clonus, if continued by Babinski's sign, he considered a certain test. Gait with uncovered feet gave valuable information, and the presence or absence of contraction of the platysma on the paralysed side was also of value in diagnosis. Dr. T. D. Savill alluded to the distribution of the anesthesia, the changes in the special senses, the scattered arrangement of the physical signs, and their variability in functional disease; also to the vasomotor changes which suggested a vascular origin for functional paralysis. Dr. Harry Campbell insisted on there being structural lesions underlying functional paralysis, although they were not at present discoverable; and to the impossibility of drawing a clear line of division between functional and organic manifestations. Dr. F. W. Mott advocated the employment of the cholin method of differentiation; if cholin were present in excess in the blood it indicated grave destruction of nerve tissue. Dr. David Drummond insisted that although no signs were infallible, yet several were for practical purposes unequivocal.

**Clinical Apparatus.**—Dr. James Mackenzie gave a demonstration on his clinical polygraph and phlebograph by which simultaneous tracings of the heart, arteries, veins, and liver, and other pulsating parts could be taken and synchronized. A system of tambour, lever, and elastic tubes connected with a metal cap fitting on the pulsating surface was attached to a Dudgeon's sphygmograph, used as a recording apparatus. His communication was discussed by Dr. Drummond and Dr. Dreschfeld (the President) who had found the apparatus practically useful in hospital work.

**Tuberculosis of the Testis.**—A discussion on the treatment of tuberculous disease of the testis, vesiculae seminales, prostate, and bladder was opened by Sir Thomas Myles. The question of the primary seat of the disease was of first importance. Tuberculous disease of the prostate and seminal vesicles was almost always secondary to disease in the testicle, that of the bladder to disease of the kidney. With regard to disease of the testis, there were two schools of opinion; those belonging to the one advised removal of the whole organ when the disease was recognized, those belonging to the other believed that a satisfactory result could be obtained in some cases by removal of disease foci. A localized nodule did not justify complete orchidectomy; other cases presented themselves too late for such treatment. When infection was general, no operation should be undertaken; but even in such an advanced condition as suppuration in a tuberculous testicle with disease of the vesicles and prostate, removal of the testicle appeared to improve the condition and increase the powers of resistance. Local treatment of tuberculous disease of the bladder he had found disappointing.

Professor Senn (Chicago) considered the examination of the urine in all cases of suspected genito-urinary tuberculosis of much importance. He had found iodoform valuable in vesical tuberculosis; he considered that a bilateral condition contraindicated operation; chloride of iodine he had also found of value for topical treatment. Professor Valentine (New York) considered that gonorrhea played an important part in rendering the genital organs vulnerable to tuberculosis.

**Pancreatitis.**—Mr. Edmund Owen read a paper on two cases of chronic pancreatitis treated by laparotomy, with complete recovery. An exploratory operation was called for in all cases of supposed malignant growth of

the pancreas. Dr. Griffiths related a case of apparent pancreatitis cured by drainage of the gall-bladder. Sir Thomas Myles had had a similar case where he had removed stones from the gall-bladder, followed by disappearance of the pancreatitis.

**Extirpation of the Prostate.**—Mr. P. J. Freyer read a paper on total extirpation of the prostate for radical cure of enlargement of that organ. He described a further series of seven cases of total extirpation of the prostate, and exhibited all his specimens, 21 in number, derived from the cases in which he had performed the operation. He had had one death in the last seven cases, occurring suddenly from heart failure, nine days after operation. He divided the cases into three classes: those in which the lateral lobes of the gland were entirely separate, those in which they were attached by an inferior commissure, and those in which the urethra was entirely enclosed by prostatic tissue. In the first two cases the urethra was left intact, in the last that part surrounded by the glandular tissue was removed. He described his method of operating. Professor Alexander (New York) read his paper on the surgical anatomy of the prostate. The true capsule of the prostate was derived from the pelvic fascia, within this was the sheath described by Thompson; the latter was removed by Mr. Freyer and other surgeons, not the former. The lateral lobes were responsible for urethral obstruction. The so-called middle lobe was merely an outgrowth from one or other of these. That part of the gland lying behind the urethra and in front of the seminal ducts was pathologically of much importance; it was here that cancer and other diseases were most frequently located. He believed that in the great majority of cases the perineal route was the best route for attacking an enlarged prostate. Dr. Parker Syms agreed with Dr. Alexander that, on the principle of attacking all growths through the most direct route, the perineal was the better route of the two. He used a special instrument for bringing the prostate down to the perineum to facilitate enucleation. In all but one, out of 21 cases, the whole prostate had been removed by this method. Mr. Reginald Harrison showed specimens from seven cases of suprapubic prostatectomy. He thought, however, that there was much to be said in favor of the perineal route. Sir William Macewen had found it necessary in some cases where he had enucleated masses from the prostate by McGill's method to make subsequently a perineal incision for drainage; he was inclined to think that this was the best route. He agreed that the lateral lobes formed the obstruction; in some cases he had removed these without opening the urethra. Dr. Valentine (New York) read an abstract of his paper on the diagnosis of urethral disease, describing his methods of urethral examination. Dr. Dalziel (Glasgow), in a paper on gastro-enterostomy for pyloric obstruction, brought forward a group of 30 operations undertaken for the relief of apparently incurable dyspepsia; many of the cases had evidence of marked pyloric obstruction. Dr. Edebohl (New York) read a paper on renal decapsulation *v.* nephrotomy. He had introduced the operation for the treatment of chronic Bright's disease. He had treated 40 cases in this way, and the results up to the present had been very satisfactory, but the ultimate result in the majority was still to be seen.

**Ectopic Gestation.**—Dr. G. T. Harrison of New York read a paper on the Etiology, Diagnosis, and Treatment of Ectopic Gestation. He acknowledged that the occurrence of ovarian pregnancy had been demonstrated, but confined his remarks to pregnancy in the Fallopian tubes. The etiology was still obscure, and the formation of a decidua in the tube by no means proved. Rupture was not the usual termination, the

embryo often being destroyed before there was any reason for rupture to occur. The diagnosis after rupture was not difficult, and in many cases might be made earlier. In operating, he preferred the abdominal way, and particularly in patients who had lost much blood; ether rather than chloroform as an anesthetic. Professor Cameron insisted on the advantages of early operation and the inaccuracy of descriptions in textbooks. Dr. Herbert Spencer said the proportion of ruptured cases to those of tubal hemorrhage and abortion was small; the danger of delaying operation in the later months when the child was alive was very great. Professor Byers concurred that ovarian pregnancy must be admitted; he personally preferred the abdominal operation, the performance of which had been greatly facilitated by the Trendelenburg position; but excellent results had been obtained by those who preferred and were more practised in the vaginal ways. Dr. Donald said that in many cases there was no clear history of a missed period. If the embryo were dead, expectant treatment might be justified; if otherwise, operation was indicated.

**Prolapsus Uteri.**—A discussion on the Operative Treatment of Prolapsus Uteri was opened by Dr. Berry Hart, who attributed the comparative neglect of surgical treatment of this affection to the complicated anatomical relations of the parts prolapsed, the serious amount of displacement in marked cases, the disheartening frequency of recurrence, and the difficulty in operating thoroughly and yet, as was nearly always necessary, leaving a patent vagina. He gave a masterly demonstration, illustrated by numerous drawings and casts, of the anatomical relations in advanced prolapsus uteri compared with those of an undisturbed pelvic floor, and pointed out where our knowledge was defective. He then described the various operative measures adapted to moderate degrees of prolapse, more particularly Westermarck's lateral elytrorrhaphy.

**Functional Neuroses and Insanity.**—Professor Clifford Allbutt read a paper on the Relation of Functional Neurosis to Insanity. After a brief exposition of the organization of the nervous system viewed as a series of centers superposed on one another in order of development, an attempt was made to explain and describe neurasthenia as a condition of the central nervous system characterized by a lowering of the potential of reserve energy of the nervous centers, as shown by readily evoked manifestations of fatigue with little power of recuperation during rest. The condition was not like normal fatigue or exhaustion which might be completely abolished by rest or sleep, but there was probably a special morbid condition of the nerve centers of congenital origin and lasting through life, which underlay neurasthenia. True neurasthenia seldom passed into insanity; it ran its own course. The neurasthenic proper had no tendency to hypochondriacal obsessions or to the development of delusions. Hysteria was a different condition from neurasthenia; it did not imply exhaustion of the nerve centers such as was present in neurasthenia, but was due to irregular activity of the higher inhibitory centers with free manifestations of certain emotions and (in hysteria major) the development of local anesthetics, paralyses, and the like. Hypochondriasis came nearer to insanity than did neurasthenia or hysteria minor. The hypochondriac very rarely showed suicidal tendencies, and, unlike the neurasthenic, who was temporarily benefited by rest and isolation, the hypochondriac grew no better.

**Syphilis and Insanity.**—Dr. F. W. Mott opened a discussion on Syphilis as a cause of insanity. He said syphilis acted as a powerful poison on various tissues of the body, and particularly on the nervous system. During the secondary stage the continued anemia and



toxemia following infection might readily excite insanity in predisposed subjects. Syphilitic brain disease (meningitis, gummata, and arteritis) in its worst and most intractable forms usually occurred within the first four years after infection. The most common and dangerous sequel of syphilis, however, in civilized man, was general paralysis of the insane, and as Kraft-Ebing expressed it "syphilization and civilization" were the two chief causes. The main arguments which favored the view that syphilis was the cause of general paralysis were as follows: General paralysis was unknown in countries or communities where syphilis was unknown; it was rare in the rural districts of Ireland and Sweden, and among priests, Quakers, and women of the upper classes, and careful investigation showed that 70 to 80 per cent. of general paralysis had had previous syphilis. General paralysis was related to tabes dorsalis, which was itself a para-syphilitic disease.

**Intestinal Secretion.**—Dr. J. S. Edkins opened an interesting discussion on Intestinal Secretion and the Action of Drugs thereon. The evidence of any true secretion occurring at all was very slight. It had been claimed that cutting all the nerves to an isolated loop of intestine produced a great increase of secretion, but it was practically impossible to do this without injuring the blood supply, and hence the fluid was in all probability of the nature of inflammatory exudation. In Dr. Edkins's own hands solutions of magnesium sulphate caused an increase, but this was accompanied by denudation of the epithelial covering of the villi, with escape of large numbers of leucocytes, followed by evidences of mitosis in the gland cells. It could not be taken as definitely established that any secretion of intestinal juice into the lumen of the bowel occurred. The functions of the mucous membrane were absorption, the transformation of peptone, maltose, cane sugar, and possibly fatty acids during absorption; the production of "secretin," which powerfully influenced the secretion of pancreatic juice and passed directly from the cell into the blood vessels; the formation of enterokinase, which increased the activity of the pancreatic ferments.

**Bacteriological Diagnosis.**—A discussion was opened by Professor Sims Woodhead on the Place of Bacteriological Diagnosis in Medicine, with special reference to Diphtheria. He insisted on the importance of co-operation between the clinician and the bacteriologist, and thought that if this was satisfactory the limit of error was reduced to about 5 per cent. He referred to the difficulties accompanying certain classes of case, notably those of nurses attendant upon cases of diphtheria and children suffering from laryngeal and tracheal affection. In the former class diphtheria bacilli might often be found in spite of the fact that the nurse appeared to be in perfect health, in the latter class, in spite of a certain clinical diagnosis, bacteriological examination might be negative. It was also not infrequently negative in the case of patients from whom swabs were taken *in extremis* or after death, owing to the fact that saprophytic bacteria crowded out the true diphtheria bacilli. With reference to the question of releasing a patient from isolation, he was strongly of opinion that this should not be done until diphtheria bacilli had entirely disappeared from the throat. Energetic disinfection of the throat should be carried out so as to hasten this object. Without disinfection bacilli might persist in the throat for many months, though a very large proportion of cases failed to show them after about eight weeks. He had found that the most virulent cases of all were mixed infections in which staphylococci were present along with diphtheria bacilli. Less severe were those where streptococci and diphtheria bacilli were present. The co-existence of strepto-

cocci, together with staphylococci and diphtheria bacilli, did not raise the mortality over that obtaining with mixed infections of staphylococci and bacilli alone.

**Enteric Infection.**—Professor Firth and Major Horrocks read a paper on the Influence of Soil, Fabrics and Flies in the Dissemination of Enteric Infection. After referring to the unreliability of much previous work owing to insufficient diagnosis of the typhoid bacillus the authors said that they found no evidence that in soils or fabrics the bacilli multiplied, but considered it to assume a vegetative existence. They had found it immaterial whether the soil was watered by rain or sewage, but the question of the amount of moisture present was fundamental. They had recovered the bacilli from as deep as 18 in. whither it had been washed by flooding the soil. In dry soil like dust the bacilli could easily be recovered up to the 25th day and could contaminate exposed agar plates at a distance, being conveyed to them by the wind. They also found that the infection was readily carried by house flies.

**Spina Bifida.**—Mr. Harold J. Stiles, F.R.C.S.E., read a paper on the Surgery of those Affections of the Nervous System which occurred more especially in Children. Mr. Stiles gave the reasons which guided him in the selection of cases for operation in spina bifida and led him to believe in excision of the sac as being the most suitable form of treatment. He had found that the injection of Morton's fluid did not give favorable results. Operation was contraindicated when in addition to the spina bifida the ventricles were already dilated by cerebro-spinal fluid. He discussed the complications such as paralysis and ulceration, and such causes of bad results as sepsis and poisoning by antiseptics. He referred to cranial meningoceles and congenital internal hydrocephalus, and summarized the various procedures adopted for the relief of those conditions which had not so far been attended by satisfactory results. Mr. Stiles described a new form of procedure which he was now trying, which consisted in drainage of the cerebro-spinal fluid under the erector spinæ muscle into the peritoneal cavity. He referred to the prognosis of cases of craniectomy for the condition of microcephaly, and in tuberculous and non-tuberculous posterior basal meningitis and in epilepsy. He discussed the surgical procedure in cases of Pott's disease complicated by paraplegia, and emphasized the necessity for prolonged rest in the recumbent posture in these cases.

**Respiratory Exercises.**—A paper was read by Mr. Arbuthnot Lane on the Value of Respiratory Exercises in the Naso-Pharyngeal Lesions in Childhood. Mr. Lane referred to the part normally played by the pressure of the air in its passage through the naso-pharynx in determining the development of the bones of the face, and pointed out the various deformities and general loss of health that occurred in conjunction with any lengthy interference with this pressure. He referred to the narrowing of the alveolar arch, increase of height in the palate, diminution in the breadth and height of the nasal cavities, lateral compression of the anterior nares, habitually open mouth, decay of temporary teeth and inflammatory condition of the lymphatic tissue of the upper part of the pharynx called adenoids, as well as to the deafness and condition of "open bite" and other deformities of the lower and upper jaws which followed. Deformities of the face could be better seen in girls than in boys, boys obtaining for themselves more readily the kinds of foods and exercise that were beneficial to the condition. It was more important to attend to the physique of growing children than to expend energy on what was called education. Dr. Ashby referred to such conditions as deformities of the chest, softening of the ribs, obstruction in the trachea and

chronic bronchitis as the result of the existence of adenoids. Sir Felix Semon asked Mr. Lane how respiratory exercises diminished organic hypertrophy of gland tissue; in his paper Mr. Lane had not referred to this part of the question. Dr. Scanes Spicer spoke of the value of exercises in preventing the formation of adenoids. He described some experiments and showed some tracings showing the pressure of air in the nasopharynx when there was obstruction and when there was not. Dr. McBride expressed himself as disappointed with the small amount of combative matter in the paper in comparison with that expressed by Mr. Lane elsewhere. He disapproved of Mr. Lane's paper. Dr. Baginsky asked what exercises could with advantage be given to infants of a few weeks old; adenoids were undoubtedly present in some of these cases. Mr. Mayo Collier could not believe that Mr. Lane had ever said that solid growths could be cured without operation. Dr. Campbell referred to the diet of starchy foods commonly given to children which predisposed them to catarrh, and led to an undeveloped condition of the masticatory muscles with the consequent deformity. Mr. Lane made no reply to the questions raised by various speakers. The value of physical exercises was hardly alluded to throughout the debate, which lacked the calm and impartial tone necessary for the elucidation of scientific problems. The discussion was in consequence disappointing, and fell below the level of those usually held.

**Arsenic.**—Professor Stockman selected for discussion the Therapeutic Value of Arsenic, and the justification of its continued use in view of recent knowledge concerning its toxic action. The polynuclear leucocytes had apparently the power of fixing arsenic in some relatively innocuous form; this was to be concluded from the fact that much larger doses of arsenic could be given by intraperitoneal injection than by intravascular injection. In the author's opinion the advantage of arsenic alone in anemia was not supported by clinical evidence, nor was there from experimental data any justification for its use. Arsenic, however, with iron was of great value in many forms of anemia. Dr. Stockman then described his own researches on the action of arsenic upon the bone marrow, including the complete disappearance of all leucoplastic cells, erythrocytes, and fat cells, and their replacement by a hyaline substance resembling mucin. To this he attributed the fatal anemia. Dr. Pope then read a paper on Arsenic in the Treatment of Chorea. The way arsenic was given was important; he began with two and a half minim doses, and when increased was always given in a dilute form. Dr. Wild gave the result of his treatment, mostly in cases of skin disease, by arsenic for the last 10 years. With regard to the use of cacodylic compounds, he was of the opinion from his experience that these substances did not act as arsenical compounds therapeutically. Professor Shoemaker (Philadelphia) drew attention to the unfortunate manner of prescribing arsenic in the United States in the form of named solutions, such as those of Fowler, Pearson, or Donovan; and to this practice he attributed some of the cases of poisoning. Prescriptions in this form were frequently passed from the patient to others, and the solution used until severe toxic effects were produced. Dr. McWalter (Dublin) held that arsenic was almost useless in chlorosis unless combined with iron; but was one of the few drugs of value in the treatment of pernicious anemia. The use of arsenic in pill form was entirely to be deprecated. Dr. Luff gave some of the results of his investigations upon the beer-poisoning epidemic, emphasizing the fact that there appeared to be no quantitative relationship between the symptoms produced and the dose taken. He would prefer to regard

the cases of arsenical poisoning as instances of want of tolerance to arsenic, and pointed out in this connection the importance of idiosyncrasy. Professor Tunnicliffe referred to the difference in their toxic power between arsenates and arsenites. Stating that this had been clearly established, yet nevertheless the pharmacopeial dose of arsenate and arsenite of sodium remained the same. Reference was made to the affinity of nucleoproteids for arsenic, and stated that the arsenic which was stored in the liver was in combination with nucleoproteids. The question of idiosyncrasy was discussed. He had found the action of selenium practically identical with that of arsenic. Dr. E. S. Reynolds (Manchester) drew attention to the fact that in the recent epidemic of arsenical poisoning only a very limited number of the people who were in the habit of drinking the beer containing the arsenic showed marked toxic effects, considering the enormous quantity of such beer consumed. He believed that tuberculous subjects were more liable to develop toxic symptoms with large doses of arsenic than others of sound constitution. Papers were subsequently read by Professor Liebreich on the Therapeutic Value of Cantharidin, by Professor Marshall upon the Pharmacological Action of Mannitol Pentanitrate, and by Mr. Colin Campbell upon the *Materia Medica* of the Intratracheal Treatment of Pulmonary Diseases. Mr. Colin Campbell showed his method of intratracheal treatment in pulmonary disease.

**The Treatment of Diphtheria.**—The Local and General Treatment of Diphtheria was introduced by the President, Dr. Tirard. The speaker said that in his opinion in view of the various reports upon this subject there could now be only one treatment for diphtheria, and that was the antitoxin treatment. He mentioned, however, that there might be sentimental objections to this treatment, and read an amusing letter which had been addressed to himself some time ago by an anonymous and aggrieved antivivisectionist. In the opinion of the speaker, the main points for discussion were (1) whether any remedy in diphtheria gave the same sense of security and hope as did antitoxin, whether the ill effects attributed to the antitoxin were not really sequelæ of the disease, and whether after the use of antitoxin greater security in laryngeal cases was afforded by tracheotomy or intubation. The address gave rise to an animated discussion. Professor Wild said one of the difficulties in the use of antitoxin consisted in the inaccuracies of the standardization. He regarded antitoxin as they had it now as only a temporary remedy, and looked forward to the time when they would be able to isolate the active principle, which would admit of much more accurate dosage. Dr. MacWalter pointed out some apparent fallacies in the statistics of the antitoxin treatment. Dr. Hopkinson supported strongly the antitoxin treatment, and raised the question of the advantage of preventive antitoxin inoculation in the attendants upon virulent diphtheria cases.

#### MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

*Stated Meeting, Held May 26, 1902.*

The President, Frank Van Fleet, M.D., in the Chair.

The scientific business of the evening was opened with a paper by Dr. Thomas J. Hillis on Medical Etiquette at the Dispensary Clinics.

**Philanthropy versus Commercialism.**—Dr. Hillis said that there is a great pretense of charity towards the poor and of supposed philanthropy in our hospitals and dispensaries, though an atmosphere of commercialism in these institutions is a constant feature. One of the grievances that the majority of the medical profes-



sion has with regard to the dispensaries as at present managed is that numbers of people are allowed to apply for treatment without let or hindrance, who are in no sense entitled, according to law, to the free medical service that should be given only to the poor. Some of this abuse is due to the fact that the dispensaries are used by calculating medical men to divert business to their empty offices. Dr. Hillis described with humorous detail and suggestive truthfulness the fine art of inveigling patients as it is practised by certain dispensary physicians.

**The Dispensary and the Poor.**—Patients who can pay good fees not infrequently find their way to dispensaries and have very little trouble in securing medical attendance. Practically every medical clinic in the city is under suspicion of fostering this evil. The possibility of such an evil has been recognized by the profession, and a law was passed for its prevention. This law is practically a dead letter on the statute books, because no properly organized effort is made to prevent its infringement. Dispensary physicians somehow do not realize how much of an evil they are inflicting on their brother practitioners, nor how sadly they are pauperizing the rising generation. The fact of the matter is that large clinics are encouraged partly for teaching purposes and partly because the attending physicians at dispensaries hope to increase their private practice by diverting patients from the dispensaries to their offices.

**Condemnation of Physicians' Advice and Diagnosis.**—Another very serious evil inherent in the present dispensary system is the fact that dispensary physicians only too often condemn unwarrantably the advice of outside physicians and repudiate the diagnosis they may have made. Not infrequently there is absolutely no reason for doing so, and they have only the word of the patient as to what his physician said to him. Often at the time when the practitioner saw the patient, the disease was in inchoate condition and had not developed to such a stage as would make its diagnosis easy. Notwithstanding all the excuses that might be made dispensary physicians not infrequently say severe things that are reported by patients outside of the dispensary and injure their previous medical attendant's reputation. Shrewd and disreputable men often use dispensaries for ignoble purposes. Because of these evils the medical profession may well protest against the present policy of our great city dispensaries

[Dr. Hillis' paper appeared in full in the issue of the *Medical News* for June 28, 1902.]

**Overdrawn Picture of Abuses.**—Dr. Thomas F. Manley of New York, in discussing Dr. Hillis' paper, said that undoubtedly there are some abuses in our present dispensary system. The picture of these abuses as made by Dr. Hillis is, however, surely overdrawn. Something may well be said for the other side. Here and there in dispensaries, disreputable physicians are found who make use of their positions for ignoble purposes. As a rule, however, the attendants at dispensaries are men of education and refinement and devote themselves unselfishly to their chosen duty of helping the poor. This is an institutional age, and charity is subserved very well by these medical institutions. The state law for the regulation of the dispensary evil is unfortunately a dead letter, but if its enforcement were properly taken up many of the evils complained of would disappear. Some physicians obtain practices through dispensaries or hospitals, but the conditions for obtaining a practice are very different now from what they were twenty-five years ago, and many of the rising generation are forced into specialism.

**Gas Leakage and Public Health.**—James C. Bayles, of New York, a mechanical engineer who has

been for many years an expert on the subject of gas transportation and gas leakage, read a paper discussing the possible effect upon the air of cities of the amount of gas that leaks out of the mains. He said that it is an extremely important and interesting question, usually not discussed outside of the directors' meetings of gas companies, and then with closed doors. Some of the possible evils of gas leakage if generally known would almost create a panic.

**Coal and Water Gas.**—Mr. Bayles said that there are two kinds of gas usually supplied for illuminating purposes. The original illuminating gas was made from coal. Its manufacture was accomplished by the distillation in closed retorts of coal rich in hydrocarbon. When thus made only about 7 per cent. of the gas obtained consists of carbon monoxide. This ingredient of gas is the most poisonous substance that enters into the composition of gases distributed for illumination or other domestic purposes. In later times gas companies have come to realize that so-called water gas may be manufactured at a much smaller cost than coal gas. Water gas itself is not illuminative, but burns with a pale blue flame, and is called in the trade blue gas. In order to make it suitable for illumination it is enriched by certain naphtha materials. Pure water gas contains about 45 per cent. of the intensely poisonous material, carbon monoxide. Even after admixture with the naphtha products, water gas contains over 30 per cent. of carbon monoxide. It is this very dangerous material that with one exception is supplied in all the cities of the country for illuminating purposes.

**Danger of Water Gas.**—It has been suggested that uncarburetted water gas should be supplied to replace other fuel for heating in our cities. This gas is entirely odorless and is an extremely active poison. Besides it is of low specific gravity and it is accordingly very hard to keep it from diffusing through pipes and their joints. It has been proposed to pipe New York City so as to furnish this "blue gas" for fuel. If this proposition were to be carried out the only safe place to live in New York City would, according to Mr. Bayles, be out of it. The gas supplied in New York City for illuminating purposes contains more than 30 per cent. of carbon monoxide and is therefore quite dangerous enough without the possibility of having the undiluted odorless blue gas escaping into our houses. At the present time the only safeguard is the odor that reveals gas leakage almost at once.

**Gas Leakage from large Mains.**—There is a considerable leakage of gas from all gas mains in our large cities. For each mile of main per annum there is a normal leakage of about 225,000 cubic feet. This is a conservative estimate. The Board of Underwriters in London calculates that about 1,748 million cubic feet are lost every year in London through the mains. This constitutes about 11 per cent. of the total gas supply. In New York it has been calculated that about 2,640 million cubic feet of gas are lost through the mains each year. A better realization of how much this amounts to may be gathered from the fact that it means nearly 10,000,000 of cubic feet every working day.

**Destination of Gas.**—The interesting question is where does all this gas go to? Beneath asphalted streets and well laid sidewalks there is practically no issue for the gas and it finds its way into the sewers and subways. The so-called sewer gas which has been mythically clad with so many destructive properties is probably always composed mainly of this gas leakage from the mains. The Park Avenue subway explosion, in Mr. Bayles' opinion, was initiated by a gas explosion that took place because of the accumulation of gas from the surrounding soil. Most of the escaped gas, however, finds its way into houses. And some of it gets beyond

the cellars and into the sleeping and living rooms and is the cause of many pathological conditions, usually supposed to be due to the wear and tear of city life. An examination of a series of houses in Boston showed that in 87 per cent. gas leakage could be detected.

**Serious Conditions.**—When illuminating gas first escapes it contains a quantity of naphtha that makes it easy of detection. This naphtha is, however, removed from the gas by filtration through the soil. This leaves it odorless and much more dangerous than before. The naphtha material may remain in patches in the soil, giving the odor of gas when there is really very little gas left. Under impervious pavements gas is always to be found; some years ago in Brooklyn an asphalt pavement that had been down only a few years began to break up in patches. If the whole pavement had deteriorated it would have been concluded that the asphalt was poor; as it was, some definite localizing cause seemed to be at work in causing deterioration in certain areas. Mr. Bayles was one of the set of experts appointed to report on the matter. Drill holes were put down through the bad patches of asphalt and at various depths below the soil the presence of gas could be detected. It was concluded that this gas had caused the deterioration of the asphalt. When bore holes were put down beneath the portion of asphalt that had remained solid, however, gas was also found present here. This vitiated the original conclusion. It seems probable that the naphtha material in the illuminating gas contains powerful solvents that cause the asphalt to deteriorate. Where the gas leak is near the asphalt this naphtha produces its solvent effect. The water gas itself, however, becomes diffused everywhere beneath the asphalt.

**Tests for Presence of Gas.**—Mr. Bayles has invented an instrument by means of which even very small amounts of water gas in the atmosphere or in soil can be detected. With this instrument the examination of rooms in houses frequently shows the presence of gas where none is suspected. Some time ago Mr. Bayles was asked to examine a house that had been unoccupied for some time and to which the family was about to return. When he came to the cellar he found the plumber's boy engaged on the (to him) amusing occupation of lighting the gas that leaked through the front wall of the house in the cellar. Mr. Bayles suggested that he would prefer to wait for the boy to pursue his amusement until he himself was some distance away from the house. The boy did not see the joke. A little later the master plumber said "Oh, that is nothing! You can do that in every house along this street." The street was one of the thoroughly asphalted streets, with impermeable pavements, so common in better parts of the city.

**Dangers of Water Gas Diffusion.**—During the summer when cellars are kept thoroughly ventilated there is very little danger from the diffusion of water gas. During the winter, however, when cellars are kept thoroughly closed up, the gas finds its way into the air of the house and undoubtedly has a serious effect upon the health of the inhabitants. As a rule people imagine that those who are overcome by gas must be very inexperienced with regard to the use of this material as an illuminant. Only jays from the country are supposedly liable to the dangers of asphyxiation by gas. Mr. Bayles has had a recent experience, however, that has corrected his own false impression in this matter. While sitting in his office he lighted a gas heater that contains two burners. By accident he failed to light one of the burners, which had immediately above it a flue through which the unburned gas was conducted into the room. Mr. Bayles did not notice the presence of the gas until he fell over as the result of asphyxia-

tion. He was then rescued by friends. He felt himself the veriest "Reuben" after this experience and realizes how easy gas asphyxiation may be accomplished.

**Sewer Gas and Water Gas.**—The very dangerous gas supposed to exist in sewers and called sewer gas is, in Mr. Bayles' opinion, only a bugbear. Sewer gas is not dangerous because it contains the germs of disease. Careful analysis of the ordinary air in sewers shows that disease germs are not frequently present in it. The air in sewers is a little better in this respect than that of the ordinary church, theater, or home. The dangerous element in sewer gas is the water gas that has leaked from neighboring gas mains. Mr. Bayles used to have considerable dread of sewer gas, but now knows that what he needs to look for is the presence of carbon monoxide. When this is absent there need be no fear of going down into trenches or excavations.

**Prevention of Gas Leakage.**—The prevention of gas leakage, Mr. Bayles considers, can only come from the companies. It will never come from them until popular sentiment in the matter compels them to lay their pipes in such a manner that the leakage is much more limited than at present. At the present time the gas loss each year costs less than would the interest on the money that would have to be expended in order to make gas leakage impossible. The companies would like to stop the leakage if it could be accomplished in some simple way. As a matter of fact, however, the prevention of it would require a very large expenditure. The dangers from gas leakage to health are constantly on the increase. Public sentiment must be educated, then, to the point where companies will be compelled to look out for the public health in this matter. The recognition of the danger that exists is already an important step in advance.

**Clinical Observations on Gas Leakage.**—Dr. Samuel Lloyd read a paper in which he gave the details of certain cases of probable gas poisoning from leakage of gas into living rooms. One of the first patients whom he treated for the condition was the female superintendent of a public school. She suffered from severe headache with flashes of light before the eyes, intense tired feeling and grave anemia. Certain other people in the same house had suffered from similar symptoms and the condition was supposed to be due to malaria. Though many remedies were tried while the patient continued to live at this house, none of them were of any benefit. After leaving this boarding house, rapid improvement in health took place. Others suffered and investigation of the house condition showed that the plumbing was badly out of repair.

**Acute Symptoms of Gas Poisoning.**—Dr. Lloyd's second case was a young man suffering with an irregular temperature that sometimes rose above 103° F.; and on one or two occasions went as high as 105° F. The bowels were regular, there was no rheumatism, the liver and spleen were slightly enlarged, the urine contained a trace of albumin and some casts. Some reddish spots were discovered on the abdomen and typhoid fever was suspected. Specimens of blood were examined, however, and the Widal test could not be obtained. There were no intestinal symptoms and quinine did no good. As the patient did not improve no matter what the treatment, change of air was advised. Immediate, rapid improvement took place as soon as the patient got away from the city. Dr. Lloyd did not think of gas poisoning in this case until another patient came down with similar symptoms in the same house. This patient was the sister of the preceding, and suffered with a daily rise of temperature, a feeling tiredness and malaise for which no drugs did any good. Careful examination of the blood did not reveal the presence of typhoid or malaria. The plumbing of the house was



subjected to the smoke test, and in the rooms that had been occupied by the brother and sister the plumbing around the wash basin was found to be seriously defective. After these defects had been repaired the patients enjoyed good health.

**Simulated Miliary Tuberculosis.**—Some two years ago Dr. Lloyd was asked to see the servant of a well-to-do family. She had come recently from the country and seemed to be suffering from some serious disease. There was a rapid pulse, lassitude, loss of appetite and weight and a recurrent febrile temperature. There were no definite signs in the lungs, but emaciation was so rapid that a suspicion of the existence of miliary tuberculosis was aroused. It was advised that the girl should return to the country and there she began to improve at once. In a few months she was entirely well. Dr. Lloyd did not think of this case as having any relationship to possible gas poisoning until another servant in the same house who had recently come from the country also began to suffer from similar symptoms; she was sent home to the country and became perfectly well. Then the employer began to suffer from severe headache, malaise, loss of appetite and a temperature that occasionally rose to 104° F. Then the family was advised to move from its quarters and since then there have been no cases of similar symptoms.

**A Physician's Family and Possible Gas Poisoning.**—Dr. Lloyd has a friend who is a member of the County Medical Society who has had a series of illnesses in his family during the past winter. The children were ill with symptoms for which no good reason could be found and the physician and his wife were each compelled on several occasions to keep to their beds for days and even weeks because of obscure febrile conditions. Dr. Lloyd thinks, in the light of other cases, that these ailments were either directly due to gas poisoning, because of the escape of sewer gas, or were the result of the lowering of resistive vitality leaving the system open to invasion by infectious material.

**Buildings of Public Resort.**—Percy Stewart, the Commissioner of Buildings in New York City, said that what Mr. Bayles has brought forward with regard to the escape of gas is extremely important for the Building Commission. Places of public resort, such as theaters, churches, meeting halls and the like, must be protected not only from possible danger from fire because of gas leakage, but must also be made free from the possible danger of being poisonous elements in the lives of people who gather in them. This matter shall be taken up seriously and the gas company will be called to account for the danger they are in many ways inflicting on the community.

**Fire Dangers.**—Mr. Stoll, of the Board of Fire Underwriters, said that the insurance men have recognized for years the dangers that exist from the immense gas leakage that is known to occur from the mains of large cities. While the underwriters have realized the increased danger of fire from this source they have been unable to cope with it or even to lessen it because the gas companies are so entrenched that legislatures can not be brought to enact measures that will properly regulate the abuse. If the Board of Fire Underwriters can obtain the hearty cooperation of the medical profession, then there is no doubt that a great deal can be accomplished in obliterating the present evil. It is something to have the matter brought so prominently before the public and to have the physicians of the country realize how much danger to human life and health there may be in this question of gas leakage and the problem of its regulation.

**Quality, not Quantity, of Gas Recognizable.**—Mr. Bayles said in closing the discussion that his invention for the recognition of water gas was a qualitative and

not a quantitative test. To have water gas present in the air at all constitutes a serious danger. To be able to recognize it even in minute quantities is very desirable, because if even as much as one per cent. of the gas gets into the air that human beings breathe, it begins to have serious effects. So far Mr. Bayles has had no difficulty in the detection of the presence of water gas, and the test method he suggests is eminently available even for ordinary use.

**Physicians and Public Hygiene.**—Dr. Lloyd, in closing the discussion, said that this question of the avoidance of gas poisoning in our homes in New York is an important practical problem that physicians should bear in mind and the lessons of which should be made available for patients. All physicians should recommend to patients with any tendencies to anemia the desirability of living in houses where all possibility of poisoning from sewer gas is out of the question.

**Smallpox and Vaccination.**—Dr. Lloyd, as the Chairman of the Committee on Hygiene of the New York County Medical Society, said that cases of smallpox have continued to occur in very appreciable numbers during the past winter. The committee considers it advisable that all the members of the County Medical Society and also all the physicians of the city should recommend that every one to whom they stand in the relation of physician should be vaccinated. The reason for the present epidemic is undoubtedly the presence of a large number of unvaccinated persons in the community. Certain physicians are only half-hearted in their recommendation of vaccination and have been known to declare people vaccinated on whom vaccination did not take. It is extremely important, too, for the public health of the city that cases of smallpox should be reported as early as possible. Doctors have even been known to conceal cases, thus leaving a large number of people liable to contagion. In this matter no personal motives of false sympathy for wealthy patients should move the physician to neglect his true duty to the community. The committee considers it advisable that the Board of Health should send vaccinators through all the city and, district by district, see that once and for all the inhabitants shall be vaccinated. This would put an end to all danger of smallpox in the city for many years.

**Unhealthy Fumes of Storage Batteries.**—Dr. Robert T. Morris said that the cars of the 34th street Crosstown Railroad are undoubtedly a source of serious irritation for delicate throats. Scarcely anyone who enters the cars at certain hours is safe from the attack of coughing that occurs through contact with the fumes from the sulphuric acid chargers by which the line is run. In individuals with weak throats or delicate respiratory apparatus this may even be the immediate cause for serious illness. A number of protests have been made to the company, but no action in the matter has been taken. It seems worth while to call the attention of the Committee on Public Hygiene of the New York County Medical Society to this abuse. On motion of Dr. Morris this was referred to the Committee on Hygiene with power to act according to the condition of affairs found and the response of the company in the matter.

#### NORTHWEST MEDICAL SOCIETY OF PHILADELPHIA.

*Stated Meeting, Held Tuesday, June 3, 1902.*

The President, Wendell Reber, M.D., in the Chair.

**Deaths During Operation.**—Dr. William H. Good read a paper entitled "Are not Some Deaths During Operation in the Region Supplied by the Trifacial Nerve Due to Inhibition of Respiration and of the

Heart?" in which he reported the histories of four patients, two of whom died. The first was a case of epithelioma of the lip in a nervous, anemic man, which was being treated by massage. During the manipulations incident to the treatment, the heart rate was reduced to 20 per minute, and the respirations, which were feeble, to 12. Treatment was taken up the next day and again caused inhibition. The second patient was a young woman suffering from a badly inflamed gum, due to a carious tooth. After taking a few whiffs of chloroform she was seized with a clonic spasm, followed by complete cessation of breathing and stoppage of the heart action, but was restored by mouth-to-mouth insufflation. The next day she suffered a sudden attack of apnea, without loss of consciousness, as her husband at the beginning of the attack immediately started insufflation. A third case was reported, in which the patient was just becoming conscious after chloroform anesthesia, when the heart and respiration suddenly ceased and death ensued. A case similar to the last was that of a child, who was just regaining consciousness after passing through an operation for naso-pharyngeal adenoids, when he suddenly expired.

The treatment of such conditions by forced distension of the lungs in order to start up the respiratory mechanism and decrease the tones of the cardio-inhibitory centre, as recommended by Ott, was commented upon and thought to be of value, although attention was called to the fact that care must be exercised not to over-inflate the lungs when a bellows is used. This principle was also shown by demonstration upon a rabbit, the application of irritants, such as ether and ammonia, or pinching the nose of the animal, being found to produce marked inhibition of the heart and complete cessation of breathing.

The discussion was opened by Dr. Samuel Wolfe who stated that he felt that the subject should be approached from several different standpoints, particularly the anatomical and physiological. The fact is well established that any impression upon the peripheral nerves anywhere in the region of the trifacial nerve will affect circulation and respiration, the degree of the impression varying according to the strength of the stimulus. Attention was directed to the especial effect produced by stimulation of the sensor area of the trifacial nerve, which was accounted for by the fact that the trifacial nerve is the sensory supply for practically all the special sensory organs, and while it has not yet been traced, it is thought quite probable that the trifacial nerve is also directly connected with the pneumogastric nerve. It is also very likely that there is a direct communication between the sensory route of the fifth nerve and the upper portion of the spinal cord from which the phrenic nerve originates. It is the opinion of the author that the term inhibition is too often considered as meaning inactivity or paralysis, while it is in reality a carefully regulated harmonious action. The inhibition which is produced by the application of anesthetic to the nostrils is the result of an attempt on the part of Nature to keep it from penetrating further into the respiratory tract by causing a cessation of respiration. As the trifacial nerve is the center of the sensory supply for all the special sensory organs, including respiration, it necessarily follows that any irritation of this nerve will produce inhibition and, if the irritation is severe enough or long-continued, fatal results may ensue.

Dr. Charles C. Biedert directed attention to the fact that the anatomical arrangement of the nuclei of the sensory portion of the trifacial nerve extending down through the medulla and the spine, must necessarily come in contact with practically all the principal nerves in the brain. The close communication of the pneumo-

gastric nerve and the trifacial nerve is evident from the nausea and vomiting occasioned by an attack of migraine. Another example of the direct communication of this fifth nerve with the other principal nerves of the body mentioned was the observations of Dr. Ross with tetanus, which demonstrate the fact that this peculiar kind of tetanus starts in the face and gradually extends over the entire body, eventually proving fatal. While this disease is by some thought to be microbic in origin, most neurologists look upon it as a reflex condition.

Dr. I. Newton Snively stated that he felt that many of the deaths during anesthesia could be explained by this inhibitory process, and considered that artificial respiration was one of the most important factors in resuscitating the patient who was temporarily inhibited.

Dr. Ellis E. W. Given stated that in the cases cited by the author he felt that death was due to the chloroform anesthesia, instead of being produced by reflex causes, the operation being commenced before complete anesthesia was established. Had ether been used as an anesthetic it was thought that the results would have been far more favorable.

Reference was made to the collection of CO<sub>2</sub> in the blood during inhibition of respiration, which substance when collected in sufficient quantities will assist in starting the respiratory organs. Ammonia was thought to have a reviving effect in some cases while in others it will produce a condition of paralysis.

Dr. Solomon Newmayer reported the case of a man who had been operated upon for sarcoma of the throat. Prior to the operation his pulse rate was from 60 to 80 per minute, but immediately thereafter it was reduced to from 30 to 50 per minute, and the possibility of a chronic irritation in the neighborhood of the trifacial nerve sufficient to produce these symptoms was suggested.

Dr. Wendell Reber told of a man who, preparatory to treatment of the thumb, injured in coupling cars, was given A. C. E. mixture. Within a few minutes after the administration of the anesthetic respiration ceased and all efforts to resuscitate him were in vain. The autopsy revealed that he was in almost perfect health and no cause for death apparent, but it was probably due to inhibition. Another case which had fallen under the observation of the speaker was that of a woman who had come to him suffering from a foreign body in the cornea, which he removed under cocaine. During the operation the patient collapsed and remained unconscious for about ten minutes, which condition it is believed was due to irritation of the trifacial nerve.

Dr. Carle Lee Felt stated that he believed most of these cases of inhibition during anesthesia were those in which chloroform had been used. He also cited a case in which bromide of ethyl had been administered prior to the extraction of a tooth, which was followed by inhibition. He did not feel that this condition would occur in ether anesthesia, provided the condition of the patients was carefully observed during its administration. The value of insufflation in restoring these inhibitory conditions was remarked.

In closing the discussion Dr. Good stated that it would be impossible to produce complete paralysis of the cardiac and vaso-motor centers, without resulting in the death of the patient, and until this stage is reached stimulation of the peripheral nerves is likely to produce these inhibitory conditions.

**Ulcerations and Stenoses Following Laryngeal Intubations.**—Dr. M. P. Warmuth read this paper. He reported four cases coming under his observation. He exhibited the pathological specimens and showed the seat of the ulceration. In all these patients had lived



for some time after the intubation. In some of the cases the tube was coughed up a number of times by each patient and on many occasions artificial respiration had to be resorted to in order to resuscitate the patient. Where ulceration is present, the temperature and pulse will remain persistently high and the patient weak and delicate; while where there are no ulcerations the child will regain his strength and in most cases make a good recovery. In the ulcerative cases, when the tube is coughed up, it has to be reinserted immediately in order to prevent collapse of the larynx.

Dr. Nathan G. Ward referred to the experimental work of Dr. Lord of Cleveland in the larynx and pharynx. It was observed that in operations in this region involving the supralaryngeal nerve would produce inhibition, either with the patient under the influence of anesthesia or otherwise, and it made no difference whether the patient was in the primary or secondary stage of anesthesia so far as the mechanical irritation was concerned. In six cases of intubation all exhibited marked signs of inhibition, two proving fatal immediately. The fact has since been established, however, that the use of cocaine will prevent this inhibitory condition during intubation.

In closing the discussion Dr. Warmuth stated that antitoxin was used in all the cases, but he did not feel that it played any part in the production of the symptoms present, the condition, in his opinion, being due to the presence of streptococcus, which was there before the diphtheria bacillus had produced the inflammation. Experiments with the intubation tube upon healthy individuals have shown that its insertion in such cases usually produces spasms and marked inhibitory change, the reason this condition does not occur in diphtheritic cases being attributed to the protection afforded by the membrane present.

## BYWAYS OF MEDICAL LITERATURE.—VI.

### DR. MITCHELL'S STORIETTES.

A SERIES of very short stories, occupying, as a rule, scarcely more than a page in the magazines, are appearing from the pen of Dr. S. Weir Mitchell. Most of them might seem scarcely more than trivial passing incidents but for the literary quality that the genial doctor's pen has conferred upon them. Some of them are the ordinary incidents in life touched with a sheen of humanity that the physician is apt to have brought to his attention rather frequently. Perhaps some of the physicians of the present generation who have literary aspirations will realize after reading them that they are possibly permitting valuable literary material to escape them in failing to note the salient points of many a humorous *contretemps* that our close touch with human nature at its best gives us familiarity with. The last story in the June *Century* contains just that touch of realism at the end of a sailor's yarn that so often "makes ducks and drakes" of what might otherwise be a rather good ghost story. One of the old frigates of the line is supposed to have a vision off Flamborough Head of a fight at sea just at the moment when the Constitution and La Guerrière were having their fight off the coast of Nova Scotia. The suggestion that time allowance for the ghostly visitation would have to be made because of the difference of longitude, if the story were true (for the ships were some 3,000 miles apart), rudely spoils the proper ghostly effect.

### THERAPEUTIC OPTIMISM.

In the last number of the London *Practitioner* there are some characteristic stories of great London consul-

stants, which inculcate the advantage of therapeutic optimism. A distinguished patient in London suffering from disturbance of digestion with enlargement in the hepatic region, some jaundice and ascites, Sir William Jenner was sent for. Sir William at once pronounced the case to be cancer of the liver, declared the prognosis as absolutely hopeless, said that his therapeutic services could be of no avail, and went his way. Friends of the patient were not satisfied and Sir Andrew Clarke was called in. Sir Andrew with the canny ways of his Scotch ancestors did not at once pronounce the fatal word cancer and condemn the patient to hopeless illness, but said that he was suffering from a neoplasm of the liver almost certainly not benignant in character, but that much might be done to relieve his symptoms, make him much more comfortable and the course of the case could be watched for possible favorable developments. Sir Andrew continued to have charge of the case for many months to the great satisfaction of the patient and his friends and not without material benefit to himself.

Apocryphal optimism and its expression even in the countenance, there is a story of Sir Richard Quain, who, in his early days, being asked to visit a patient with an old practitioner friend, put on an extremely serious face as they reached the door. His old friend said to him, "For the Lord's sake, Quain, don't wear any such face as that, or the patient will take you for the undertaker."

The *Practitioner* might well have added another characteristic story that is told of Quain in later life, and which shows how well he learned the lesson of putting a good face on things. A member of the nobility in London fell sick of a complication of diseases that led to the development of considerable anemia and great emaciation. There was question just what the ailment might be. Cancer was suspected, but its seat could not be demonstrated. There was also question of pernicious anemia, or some other serious disturbance of the blood-making organs. Several consultants distinguished in their profession had refused to give a name to the nobleman's ailment. His sister who had had long years of experience under Dr. Quain's care, was sure that the doctor would be able to name the disease. Quain was called and made his examination. The sister demanded, what was the name of her brother's ailment? Quain, without a moment's hesitation, replied: "He is suffering from cachexia," a term which the sister triumphantly repeated for the benefit of the rest of the family as showing how much more definite was Dr. Quain's knowledge than that of the other consultants called.

### THE CHEERFUL PHYSICIAN.

As we have touched upon the question of a cheerful face as a necessity for a physician we are reminded of some of the stories with regard to Rabelais, the great French writer, for whom a modern fad seems just beginning. It is not usually known that Rabelais was a physician and wrote during his leisure hours, the great humorous works, by which he is to live forever, at the time considering that they were of little account. Rabelais' serious work on medicine, its author fondly hoped, would surely give him a name among the great medical men of his age. His personal character seems to have been of a kind to make all men like him. He once said with regard to the disposition of the physician towards his patient that "a sad, or surly-faced physician, is one of the worst things for an invalid; while a physician of a glad countenance, open and serene maketh a sick man happy. As to the speech of a doctor, it should have but one end, without offense to God, to rejoice the heart of the sufferer." It is in-

teresting to find that Rabelais followed his own advice, which is not always true even of the great physicians. A nobleman friend who was ill once wrote to him: "I am not well; drugs do no good; I do not know what is the matter, nor do I think that my physician knows. I am sick for you. Come, and your cheerful face will soon make me better." The secret of the success of many a physician is contained in the one word, personality, of which Rabelais seems to have had no lack.

#### ABUSE OF PSYCHOLOGY.

There is no term at the present time that is more abused than the word psychology. Studies in the physiology of nerve transmission, of reflex nervous action and the like, are all dignified by the name of experimental psychology. To credit the newspapers particularly it would be hard to imagine that there was any distinction between nervous physiology and anatomy and true psychology. There are many who seem to think that psychology mainly consists in the use of long terms, and who feel sure that Dr. Johnson's description of a network as a decussated or reticulated material with interstices between the intersections would appeal to many students of psychology as an eminently suitable set of words to be used for the description of the network of fibrils in the brain in order to make clear how complex is the physical basis of ideation. Of late we have had a very marked tendency to assume that animals and their ways are something more than merely analogous to man and that corresponding terms and ideas can be used to explain the action of the different speeches. Take, for instance, these sentences from a recent work on cerebral science:

"The feelings of ideal attachment in the dog and sheep are cerebral anterior, as those of real attachment are cerebral posterior. Anterior feelings are to be located both in the mouth zone and the head zone. The kissing or licking center is infracentral. The adoring or fawning center, it would appear, is precentral or anterior superior."

We hope that the subject is clear to our readers, though we do not quite like the juxtaposition of kissing and licking and adoring and fawning. Perhaps our feminine readers may also object somewhat strenuously!

#### THE OTHER EXTREME.

Of late years physicians have been amused by the ridiculous assumption of the invaders of medical domains who have considered that faith was sufficient to enable them to solve all the mysteries of medical science. The Christian Scientists, the faith curists, the vitapathists, all have been gifted with a copious abundance of words to explain their various theories of ills and their cure. It is not a little surprising, however, to find that those at the other extreme in regard to matters of faith are quite as liable to run off into the most senseless theories with regard to medicine and (save the mark!) therapeutics. The *Freethinker's Manual*, recently issued, has a chapter on the new medicine which is as full of absurd assumption and unscientific assertion as anything that has ever come from the hands of a Christian scientist. For instance, this: "Fever is, therefore, due to the resistance which the current finds in the blood and as soon as the current finds resistance it must overcome it or not. In the first case, we find that the resisting matter is heated and even burned. The chill in the incubation stage of fever is, therefore, caused by the consumption of the electricity of the body by the spirilli and the high temperature produced by the resistance which the products of the obstruction of the blood corpuscles offer to the electric current." The author apologizes for descanting on medical mat-

ters in a *Freethinker's Manual* but says that because he writes for freethinkers and not for medical men going to church with their prayerbooks under their arm, like one belonging to the stupid mob, "we are forced to explain the functions of the organs of the animal body and some other questions interesting to intellectual people." We would really prefer to be saved such explanations. Why is it that everyone who invents a new theory thinks that his theory will serve also to explain many things in medicine. The extension of the theories to such practical matters usually proves eminently disastrous to the theorist and discredits all the rest of his work. We would respectfully remind our philosophical friends that philosophy is one thing and medicine another and that the shoemaker gives most satisfaction when he sticks to his last.

#### RESURRECTIONIST LITERATURE IN AMERICA.

DR. FRANCIS R. PACKARD of Philadelphia, in his article on the Resurrectionists of London and Edinburgh (*MEDICAL NEWS*, July 12, 1902) mentions a number of novels that make use of incidents connected with resurrectionism as the basis of their plots. It is well known that the body-snatchers found a good market for subjects here in America also, before the enactment of our present laws with regard to the provision and distribution of anatomical material. At least one novel that had a considerable vogue about 25 years ago, used resurrectionism as a very important part of its plot. The title of the book was "Rosemary" and the author's name Huntington. The scene was laid in New York but shifts to Brooklyn, and the plot turned on the effort of conspirators to get a very handsome young woman out of the way. Somehow they could not bring themselves to actual murder, but had no conscientious scruples against the use of a mysterious drug, by which the young woman was thrown into a trance resembling death. By their connivance then the body of the supposedly dead heroine was removed from the graveyard by professional body snatchers and sold to a dissecting room. Its lifelike appearance was so striking, however, that the young medical students to whom the body was assigned refused to believe the subject dead and efforts at resuscitation proved successful. The young lady married the demonstrator in charge of the dissecting room, to whom she owed her life, as was of course proper in a well regulated novel. The details of the body snatching are given with a definiteness and precision that seem to show a familiarity with the traditions of the occupation here in America. The story will doubtless prove an interesting source of important material when the sketch of resurrectionism in America comes to be written.

#### BOOKS RECEIVED.

The *MEDICAL NEWS* acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the *MEDICAL NEWS* will shortly appear.

PRINCIPLES OF SANITARY SCIENCE AND THE PUBLIC HEALTH. By William T. Sedgwick, Ph.D. 8vo, 368 pages. The Macmillan Company, New York.

PRACTICAL THERAPEUTICS. By Hobart Amory Hare, M.D., B.Sc. Ninth Edition. 8vo, 857 pages. Illustrated. Lea Brothers & Co., New York and Philadelphia.

DISEASES OF CHILDREN. By James Frederick Goodhart, M.D., LL.D., F.R.C.P. Seventh Edition. Royal 12mo, 812 pages. P. Blakiston's Sons & Co., Philadelphia.